CHEMICAL MARKETS

THE BUSINESS MAGAZINE OF CHEMICAL INDUSTRIES

VOLUME XXXII MAY, 1933 NUMBER 5

Contents for May, 1933

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Chemical Company Control

BECAUSE he is in the Roosevelt Brain Trust, A. A. Berle's fascinating and informative book "The Modern Corporation and Private Property" deserves to be read with care by every corporation executive and stockholder.

It traces the corporation from a convenient form of partnership in which the beneficent owners (stockholders), the financial control (directors) and the active management (executives) were practically the same individuals to the modern giants in which no one of the thousands of shareholders owns a majority of the voting stock, while control is vested in a small outside group, and conduct of the business is in the hands of professional administrators. All the legal and financial devices by which control can now route profits and management hold their jobs, not always to the best interests of the real owners, are set forth in detail, and there are important conclusions as to the effects of this absentee ownership upon the future of American business.

Chemical companies are comparatively new-comers in Wall Street, and as Mr. Berle points out, Du Pont and Allied have important minority stock interests which are still in control and still active in management. This is even more true of some of our large chemical units not listed on the N.Y. Stock Exchange. Dow is still privately controlled and managed by its owners, and with the possible exception of Mathieson, the alkali companies are almost family affairs. The purchase of Swann for cash has probably not seriously affected the Queeny interest in Monsanto.

At the present moment acid tests are being applied to corporation administration. Therefore, it is interesting indeed to compare the records of earnings per share and dividends paid on common stock of companies of varying degrees of ownership-control with Mr. Berle's carefully thought out philosophy of corporate control. Chemical industry furnishes us with some conspicuous examples, and certain of his conclusions are confirmed by almost self-evident demonstration.

RESEARCH MARCHES ON

WITHOUT research there can be no progress. Imagine a world without electric lights or power. Without transportation—steamships, railroads, automobiles, aeroplanes. Without the conveniences and comforts of a modern home and without the factories that make those conveniences and comforts. Yet, that was the world a hundred years ago.

Research marches on. The Swann Corporation recognizes the importance of continually seeking the better way—better materials, improved methods and reduced costs.

Manufacturers in all lines must look toward product improvement to increase the desirability of their commodities. Perhaps Swann Chemicals can increase the purity, uniformity and desirability of your products. Call or write our nearest office.

PARTIAL LIST OF SWANN PRODUCTS

In the twelve years that Swann Acid has been available, the standards of whole industries have been raised, new products have been created, old products have been bettered—because better acid and phosphates made this progress possible.

Phosphoric Acid 75%
Phosphoric Acid 50%
Mono Sodium Phosphate
Di Sodium Phosphate
Tri Sodium Phosphate
Sodium Acid Pyrophosphate
Mono Ammonium Phosphate
Di Ammonium Phosphate
Mono Calcium Phosphate (H T Phosphate)
Di Calcium Phosphate
Tri Calcium Phosphate

SWANN RESEARCH — TO FIND A BETTER WAY

SWANN CHEMICAL COMPANY
BIRMINGHAM

Division of THE SWANN CORPORATION

District Offices: CHARLOTTE, CINCINNATI, NEW YORK, DALLAS, SAINT LOUIS, PITTSBURGH

Planned Selling A curious anomaly of the period of bad business has been the success that certain companies in many lines have won with new products. This is as true in the field of industrial materials and supplies as among goods for the consuming public. These sales triumphs are a wholesome antidote to that supine defeatism which has gripped some sales managers and many of their men.

In order to dramatize these good examples the Du Pont companies are collecting an exhibit of all the new products they have put upon the market during the past three years. It is an impressive collection. It includes a wide range of wares from synthetic rubber and dyes to toilet sets and bookbinder's cloth. But it is behind the scenes of this Depression Products Exhibit that the process industries can learn the most valuable lesson.

Although no other company in the chemical industry has such a long and varied experience in merchandizing, nevertheless the Du Ponts have learned that a very considerable investment in sales research pays handsomely. In their Chemical Division a special department carefully surveys the markets, seeking out uses and probable users, checking every move in the selling campaign. This is not a panic-born innovation, but it is significant indeed that two of the chief executives of this commercial research work agree that during the past couple of years they have learned one very important lesson. As they put it: "We have learned what we have to know before it is safe to launch a new product, and that, if our facts are accurate and complete, the sales program may be confidently adopted. It is cheaper not to start selling till you can estimate probable sales, and wiser not to start a campaign that you cannot finish."

New Prices Prices are advancing, and market editors have been busier than bees chalking up the price lists. As might easily be suspected products which are largely imported and the metallic salts were the first to feel the stimulus of the new conditions. Lead, zinc, copper, mercury, tin and silver are all appreciably higher and many of the more important chemical materials derived from them have likewise advanced. Nearly all of the leading vegetable, animal, and fish oils turned firm, and naval stores prices were sharply advanced. The same is true of many gums and waxes. Fertilizer materials scored several important price changes.

On the other side of the ledger, two important declines are the more conspicuous. On the eve of the big consumption season for calcium chloride, producers announced a reduction of $1.50 a ton on flake and 50 cents a ton on solid. The leading reason for this action seems to be a desire on the part of the producers to tempt the "anti-dust" user into continuing former tonnages. State and private economy programs in many sections will force John Doe to "eat the summer dust, even if he doesn't bite it." The second reduction is the revision of carbon tetrachloride prices. This action was wise in that the former very firm level had been broken through in the past few months and the market structure weakened. Reforming the price line at a lower level was sensible under the circumstances. The quiet entrance of a new producer undoubtedly had something to do with the unsettled conditions, but it must also be remembered that prices were unchanged from pre-depression days and, accordingly, subject to terrific pressure.

The volume of business is better, as well as the general price structure, but we would have preferred to have prices rise as a result of improved demand from producers because of improved consumption. That way would have been more orderly, more orthodox, more certain of final permanency. Still, quite a few buyers must believe the turn has come, for the scramble to get in "under the wire" on contracts is quite brisk.

Broadcasting Misstatements What an ungrateful chap Lowell Thomas has proved himself to be. As they say on Broadway, "publicity is his yen" and yet after he had miserably failed to keep his speaking engagement with the Salesmen's Association, these energetic propagandists not only forgave him, but even "put him across in a big way" and have since from time to time given him good, exclusive news bits for his own broadcast. If any radio artist should be friendly to chemical industry, it is he.

Nevertheless on April 25th, over the N.B.C. network, he savagely attacked the industrial alcohol industry with misstatements of fact and some very nasty implications. In the transcript of his broadcast, which we understand is verbatim and official, not one single sentence of what he is reported to have said about the proposed alcohol-motor fuel law is entirely honest—not even his statement that "the Sun Oil Company has asked me to bring this whole matter to your attention" for most certainly they paid him and maybe they told him.

Matter of the sort that Thomas broadcast, if printed, is indubitably libelous. The case is so clean-cut that unless the refiners of the

popular Sunoco gas retract and put the facts before the radio public, there are many people interested in publicity who will hope that the Alcohol Institute will get a needed, sharper definition of the legal responsibility of paid broadcasting.

Sense or Sentiment A good friend has asked a fair question which we should like to answer publicly. He writes:

Your editorial point of view is so often in accord with my own that I am puzzled to find your attitude toward world economics (especially tariff and export) so very provincial. I can see why "Little America" should be the selfish point of view of the chemical industry; but I am disappointed that your independent and outspoken editorials should slavishly reflect the commercial prejudices of your own trade rather than the broader interests of our country.

Chemical industry is so utterly dependent upon its customers that chemical interest coincides with national interest to an exceptional degree; so if we are wrong in advocating a militant nationalism, we may be mistaken in principle, but we are not misguided by prejudice. The chief reasons for our position may be summarized: 1. Political and/or economical internationalism is impractical. 2. The United States is able to subsist practically as a self-contained economic unit. 3. It is safer and more kind to withdraw our enormous agricultural and industrial productions from world competition; and it is wiser to do so unless we are willing to accept the consequences of meeting, both here and abroad, the competitive terms of the cheapest raw materials and the lowest wages.

With many supporting facts these same premises have been most clearly and completely demonstrated by Dean Donham in his paper "National Ideals and Internationalist Idols." To any of our readers who find their own conclusions on this important subject not thoroughly self-satisfying, we commend this delightfully written argument. It has been reprinted by the Chemical Foundation and may be had from them for the asking.

Chemical Buildings The current issue of the *Architectural Record* impresses anyone with the contributions of chemical industry to the building and allied fields. Many directly connected with this industry fail to appreciate the inroads of chemically prepared products in the last few years; that the lay public does not, of course, is certain. In this architect's journal are descriptions of a cloth treated with special flexible phenolic resinoid material; a new leather recently announced by the Mellon Institute that through chemical treatment maintains a polish and resists scuffing; latex-impregnated paper; a resin-faced sheet veneer; a new fireproofed cotton fabric; phemaloid compound lumber, a plywood laminated with phenolic resins; special atmosphere-resisting steels for small house construction, to mention but a very few examples. All of these developments have been pointed out in recent numbers of CHEMICAL MARKETS, and so are not entirely new to our readers. The surprising thing is that they have been so quickly and eagerly grasped at by architects, builders and interior decorators. It certainly indicates the receptiveness of other fields to the possibilities presented by real chemical developments. Assuredly the day of thinking of the chemical industry in terms of a sulfuric acid plant or an alkali works has long since past.

Quotation Marks

This Government intervention weakens the self-reliance of the people. At the same time, Government is not more loved for it, but less loved. Never in my lifetime has Government been held in less esteem than at this moment when it is bursting its suspenders to help everybody on the place. Forty years ago, to hear our democratic form of Government questioned provoked surprise, or a laugh. Now questioning of our Government is an everyday matter. The more Government we have, the less we care for it.—*Will Payne in The Saturday Evening Post.*

Obviously, if tariffs are lowered to the point where there is a general increase in imported goods, the chemical industry would suffer in its direct sales to the public, and even more largely through a decreased demand for its products used in other manufacturing processes.—*Industrial and Engineering Chemistry.*

Fifteen Years Ago

From our issues of May, 1918

A report issued says that during a six months period in wartime there were 3,000 strikes in U. S., involving 283,402 employees, and that the total number of days of production lost was 6,000,000.

Kuttroff, Pickhardt & Co. Inc., has been organized under laws of New York State to deal in dyestuffs, colors and chemicals.

Largest taxicab company in Paris discovers use for benzol as motor fuel. A very suitable mixture for motor cars can be obtained by 50 per cent. alcohol, 25 per cent. benzol and 25 per cent. gasoline.

National Aniline and Chemical Co. lease entire building at Broad and Wallace Sts., Philadelphia, in addition to space in Warner Building adjoining on North Broad St., and will remove plant to this location.

Brunner-Mond Co. of Canada, Ltd., contemplate erection of plant for manufacture of soda ash at Amherstburg, Ont., at estimated cost of $3,000,000.

Johnson and Johnson, New Brunswick, N. J. award contract for construction of two-story building, estimated to cost about $10,000.

It is reported that the quantity of sulfuric acid produced in 1917 was nearly twice as great as that produced in 1913.

Below is a memorandum on the legal aspects of resale price maintenance prepared privately for a group of chemical executives and provided here by the author's special permission.

Would the Capper-Kelly Bill Maintain Chemical Prices?

PRICE maintenance by contracts between the manufacturer and wholesalers or retailers was used almost exclusively in the United States from the early eighties until 1911, when the Supreme Court, in the case of Dr. Miles Medical Co. vs. John D. Park & Sons Co., denied the right of the manufacturer to fix prices by contract. In later decisions the court held uniformly that resale price maintenance contracts are illegal whether applied to "Trademarked," "Patented" or "Copyrighted" goods, and whether practiced by individual manufacturers or by trade associations.

Another method was the refusal of the manufacturer to sell to any dealer who sells below the price specified by the manufacturer. Until 1920 the right of a seller to select his customers was not questioned, and was approved by the courts if no *agreements* to maintain prices were involved. During the year just mentioned, the Government brought suit against the Beech-Nut Company on the ground that it violated Section 5 of the Federal Trade Commission Act by maintaining resale prices. In its decision the Supreme Court did not restrict the right of the manufacturer to refuse to sell but it prohibited the use of salesmen or agents to report instances of price cutting, to compile and use lists of price cutters, to report those names to wholesalers, and to use serial numbers as a method of tracing the movement of goods. In other words, although the right of the manufacturer to choose his customers was not denied, he was prohibited from taking any effective steps to ascertain who were undesirable customers, that is, price cutters.

In 1926 the Sixth Circuit Court (Toledo Pipe Threading Machinery Co. vs. Federal Trade Commission) ruled that it was not illegal for a manufacturer to inform dealers that no sales would be made to price cutters. The court also decided that the manufacturer had the right to employ salesmen to investigate and report instances of price cutting. However, the court declared that it was illegal to require an assurance from dealers with whom business relations had been discontinued on account of price cutting to the effect that they would not again sell below specified prices and making this assurance a condition of resuming business dealing with them. This decision resulted in considerable confusion since it created doubt whether manufacturer could resume business relations with a customer who had been dropped on account of price cutting. If, after the resumption of relations, the dealer observed the conditions required by the manufacturer, a strong presumption would be created that the two had reached an agreement to maintain prices.

It is now generally conceded that price maintenance in some form is necessary to protect the intangible right of property, to eliminate certain types of unfair competition and to introduce order into many lines of business. In view of this it will be interesting to examine methods suggested to bring about this desired end. Broadly speaking these suggestions fall into two groups:

1. Price maintenance with Governmental participation.
2. Price maintenance without Governmental participation.

Price maintenance with Government participation was practiced extensively during the World War. Under normal conditions price fixing and enforcement by the Government are contrary to the principles on which the American economic system operates. A modification of this system would be to delegate the right of price fixing to private business and provide for enforcement by the Government. This would involve the creation of an expensive and cumbersome Governmental bureaucracy and would lead to objectionable Government interference with business. If the Government is asked to enforce prices fixed by private enterprises, the Government will inevitably demand the right to approve those prices. Therefore, it seems best for business to demand legalization of methods of price maintenance which function through the initiative of private business enterprises and which would permit of enforcement by means of civil action against the price cutter.

This type of remedy was provided in the bill introduced by Representative Kelly in the House of Representatives on April 15, 1929. Senator Capper introduced a corresponding bill in the Senate. The Kelly bill was extensively amended and in its amended form favorably reported by the Committee on Interstate and Foreign Commerce of the House on January 27, 1930. Because of the interest in and importance of this measure, and as a law will probably be passed in the near future as the result of its introduction, the bill and its legislative progress will be discussed in detail. The bill as amended provides:

1. that no contract relating to the sale of a commodity which bears a "Trade-Mark" and which is in fair and open competition with commodities of the same general class produced by others shall be deemed to be unlawful by reason of any agreement contained in such contract that the vendee will not resell such commodity except at the price stipulated by the vendor;
2. that during the life of such an agreement all purchasers from the vendor for resale in the same city where the vendee is to resell the commodity shall grant equal terms as to purchase and resale prices; and
3. that agreements are not binding in case of sales for the purpose of discontinuing dealing in such commodity or of disposing, toward the end of a season, of surplus stock or goods or selling damaged goods or those which have deteriorated in quality or in case of sales by a receiver, trustee or other officer acting under the orders of any court or any assignee for the benefit of creditors.

The purpose of the Capper-Kelly bill is to restore the liberty of contract as it existed under the common law before the passage of the Sherman Act. The bill permits the manufacturer to contract with the wholesaler in regard to resale price, and permits the wholesaler to contract with the retailer as to the price which the latter will charge to consumers. The adequacy of the provision cannot be doubted if the manufacturer and the distributor are in direct contract. The appearance of middlemen, however, creates difficulties.

If the manufacturer sells to the wholesaler, he can control the price which the wholesaler will charge to retailers, but he cannot control the price charged by retailers. The latter can be controlled by the wholesaler. Under the proposed law, however, the wholesaler would not be compelled to enter into contract with retailers providing for resale price maintenance nor to proceed against retail price cutters. It is not clear whether it would be legal for the manufacturer to exert pressure on the wholesaler to secure such contracts from retailers. The right of the manufacturer to refuse to sell to wholesalers who do not make agreements with retailers covering resale price maintenance would have to be determined by the courts. Whether or not the courts would hold such a policy as being in restraint of trade is doubtful. Should the courts declare that resale price-maintenance contracts are lawful only as between the manufacturer and the distributor to whom he sells directly and that the use of pressure against wholesalers who refuse to make similar contracts with retailers is not legal, *the Capper-Kelly bill would help only those manufacturers who deal directly with retailers.* The original Capper-Kelly bill provided that "the vendee will require any dealer to whom he may resell such commodity to agree that he will not in turn resell except at the price stipulated by such vendor or vendee." This provision was eliminated from the bill by the House Committee on Interstate and Foreign Commerce.

If it is assumed that the manufacturer will be allowed to exert pressure on the wholesaler to secure resale agreements from retailers, or not to sell to price cutters, the problem would still not be completely solved. The wholesaler's interest in maintaining retail prices is not nearly as great as the interest of the manufacturer. The wholesaler would probably not be willing to incur any considerable expense and possible ill will in investigating instances of price cutting or in prosecuting violators of resale price maintenance contracts. The major part of this cost would fall on the manufacturer. Furthermore, it would not be easy for the manufacturer to discover in all cases which wholesaler was selling goods to price cutters.

A much more serious defect in the Capper-Kelly bill is in the limitations which it places on resale price maintenance. It permits distributors to disregard such agreements in closing out stocks for the purpose of discontinuing dealings in that commodity, or for the purpose of seasonal sales at a sacrifice. The distributor is also permitted to sell goods below the price stipulated in the contract if he gives notice to the public that goods are damaged or deteriorated in quality.

The insertion of these provisions in the bill was due to the desire to protect the distributor on the assumption that this legislation is specifically designed to protect the manufacturer, and that therefore it is necessary to place limitations on resale price maintenance. The inclusion of these prohibitions is objectionable not on the ground that they are unfair to the manufacturer, but because they are too general in scope, applying to all industries, and they will lead to abuses which will in a large measure destroy the effectiveness of the law if and when it is finally passed. The settlement of such questions should be left to private enterprise without the compulsion of law. They can be taken care of in each separate agreement to the satisfaction of the vendor and vendee, according to the circumstances in each case and industry. In industries where seasonal swings in production and demand are very marked, resale price agreements would have to take into special account the problem of disposing of seasonal surpluses. Similarly the disposal of damaged goods can be taken care of in the contract between the producer and the distributor without any special legislative provision.

There can be no quarrel with the provision exempting bankrupt distributors from abiding by the resale

price maintenance requirements, except that such provision is actually unnecessary, since price maintenance contracts were not under the common law applicable to bankruptcies.

The most objectionable feature of the original Kelly bill is the provision that the seller must not differentiate by granting rebates or discounts to any purchaser for resale at retail in the same city or town where the vendee is to resell the commodity. This restrictive provision was due to the desire to protect the small and independent distributors from unfair (unequal) competition with the large distributors who would be able to obtain rebates or special considerations from producers.

Rebating or price discriminations of various types are now a part of our entire system of price making and their legality has not been questioned unless used to restrain trade or to eliminate competition. It is certainly undesirable to prohibit such practices in a bill dealing with resale price maintenance. These two business policies have nothing in common, and are used by producers to accomplish entirely different results. The object of resale price maintenance is to eliminate competition through sales below the price stipulated by the producer of a commodity. The prohibition of rebates or discounts would not contribute in the slightest to the accomplishment of that end.

Realizing the inadequacy of the bill, as amended by the House Committee, Representative Kelly and Senator Capper both introduced new bills on December 8, and December 9, 1931. The House bill (H.R. 11) was referred to the Committee on the Judiciary. The Senate bill (S. 97) was sent to the Committee on Interstate Commerce which reported it out without amendment or comment.

The new bill, after it was amended by the House Committee, provides:

(1) That no contract relating to the sale or *resale* of a commodity which bears (or the label or container of which bears) the trade-mark, brand, or name of the producer or owner shall be deemed to be unlawful or in restraint of interstate or foreign commerce or in violation of any statute of the United States by reason of any agreement contained in such contract.

a. That the vendee will not resell such commodity except at the price or prices stipulated in such contract; and/or

b. That the vendee will require any dealer to whom he may resell such commodity to agree that he will not in turn resell except at the price or prices stipulated in such contract: Provided, that prices stipulated in any such contract shall be uniform to all vendees in like circumstances, differing only as *to quantity of such commodity sold, the point of delivery, and the manner of settlement.*

(2) Any such agreement in a contract in respect to interstate or foreign commerce shall be deemed to contain the implied condition that such commodity may be resold without reference to such agreement.

a. In closing out the owner's stock for the purpose of discontinuing dealing in such commodity; or

b. In disposing of such commodity when damaged, deteriorated or soiled with prominent notice to the public that such is the case; or

c. By a receiver, trustee or other officer acting under the orders of any court; *Provided, that such commodity shall have been first offered to the vendor by written offer at the price paid for the same by such vendee and that the vendor, after reasonable opportunity to inspect such commodity, shall have refused or neglected to accept such order.*

(3) *Contracts for the sale of such commodity may provide for disposal and/or seasonal sales at appropriate times, during which period such commodity may be resold without reference to such agreement, provided that it shall first have been offered to the vendor by written offer, and that such vendor, not less than thirty days prior to the date stipulated in such contract for the next such disposal and/or seasonal sale, after reasonable opportunity to inspect such commodity, shall have refused or neglected to accept such offer.*

The sentences or words in italics indicate additions to or changes made in the bill as favorably reported by the House Committee.

The new bill is a great improvement. It enables the manufacturer to control the price charged by the sub-purchasers. The bill states specifically that the producer will have the right to require the vendee not to resell the commodity to any dealer who does not agree to sell at the price stipulated by the manufacturer.

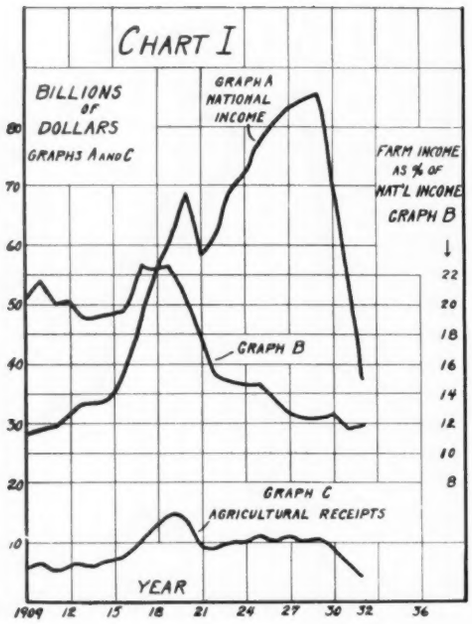
The prohibition of rebates and discounts is softened by providing that uniform prices shall be charged "to all vendees in like circumstances." The term "like circumstances" may mean many different things and will introduce a large measure of uncertainty into business relations. It has no place in a statute of this nature and will result in frequent appeals for judicial interpretation. The provisions of the bill that different prices may be charged on the basis of quantity, the point of delivery, and the manner of settlement are specific and cover the principal reasons for the usual granting of rebates, discounts, etc.

The provisions of the original House bill for disposing of stocks for the purpose of discontinuing dealing in a commodity or for selling damaged, deteriorated, or soiled commodities or for bankruptcy sales are modified in the new bill to the extent that the vendor must first offer the commodities to the producer. Goods can be sold below the specified price if the producer refuses to buy them back at the price paid by the vendee. This modification gives some additional protection to the manufacturer but at a price that he may not be able or willing to pay. The law should certainly not attempt to regulate these matters but should leave them to be settled by the producer and distributor by voluntary agreements.

The section dealing with seasonal sales appears superfluous. It states that contracts for the sale of trade-marked articles *may* provide for disposal or seasonal sales at appropriate times below the specified price. It permits something that is not prohibited, but at the same time provides that such contracts are invalid if the vendee does not first offer the goods to the manufacturer at the price paid by him. If the manufacturer refuses to buy the goods back, the sale below the specified price can take place. No special legislative provisions are necessary to regulate such transactions, which also should be left to negotiations between producer and distributor.

Farm Consumption *vs.*

By John M. Weiss



DEPRESSION in the midst of plenty is an anomaly. We have in the United States raw materials and food with ample factory capacity to supply all our needs. Yet we have want and unemployment. With all possible material resources, we have industrial stagnation. The goods are available but do not circulate. Before prosperity can be restored, this circulation must be reestablished.

Prosperity is measured by the velocity of interchange of goods between producers and consumers. This interchange forms a closed circuit, or rather many closed circuits, which branch and interlace into a complicated structure. The shorter circuits are local transactions and the ones of greater and greater amplitude represent state, national and international commercial activities. Of all these, national circulation is by far the most important, certainly as far as the United States is concerned. Foreign trade may be of greater importance than its proportions would indicate, but it has always been small compared to our domestic trade.

The wisdom of our forefathers prevented legal obstruction to the flow of commerce between the states. Therefore, no obstacles exist to the free flow of commerce within the country and this heritage should be stubbornly preserved. Extra territorial obstructions in the form of tariffs have been set up, behind which barriers our industries have flourished. Our economic system has been geared to this protection. Probably our development from debtor to creditor nation will require modification in this policy as a long time trend, but it is generally agreed that a radical, sudden change would be fatal.

How can we stimulate the increased flow of goods and services so essential to prosperity? It would seem logical first to inspect our internal economic structure to find what factor is out of balance, thereby strangling the most important part of our circulating system. If in the human body the free flow of blood is clogged as a result of some injury or disease, artificial and sometimes painful or even radical emergency measures, based upon a proper diagnosis, must be taken to relieve the congestion. With this simile in mind, we should determine the proper diagnosis of our present national dilemma. No stigma should attach to a measure simply because it is artificial. The depression was "man made." It is doubtful if natural processes alone will provide the necessary corrective measures in the near future.

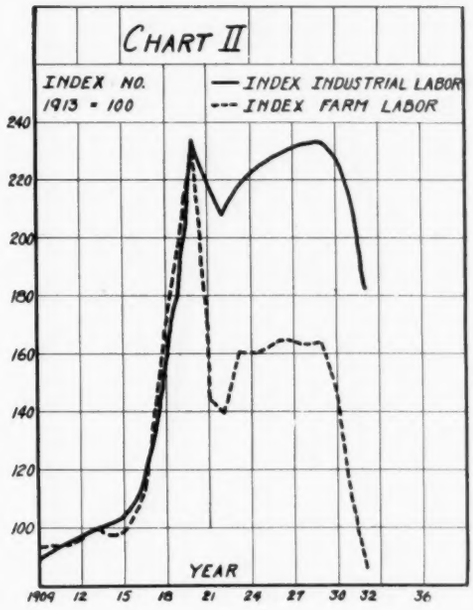
Many remedies have been administered which in general have been merely stimulants, "shots in the arm," with the hope that the body during the interim would set up its own cure. But this has not taken place. The body is weaker for its powers of resistance have been worn down. The circulation has not been restored. Some of the doctors from the beginning have said that the agricultural limb of our organism has withered away and that without restoring its full functions, the whole body politic will be sick. Stimulants have been administered to the farmer without beneficial effect, but at great sacrifice to the rest of us. Other ministrations are now being considered and we cannot afford further failures. The objective of farm relief is correct, but we must be sure that the method adopted will be a real cure.

Before considering treatment, let us know what the record shows on the agricultural problem in its relation to our national difficulties.

Our domestic circulation can be divided into three main organs, namely, agricultural production; manufacturing production; and transportation and distribution. Each organ is comprised of producers and consumers of goods or services. The whole cannot prosper unless each performs both functions. Hence, if the agricultural population cannot consume or produce its quota, the whole structure is out of balance. Its capacity to produce is unquestioned. Its capacity to consume is not only at a low ebb at the present time, but the trend toward decreased consumption began long before the depression started. This is evident by referring to the graphs in Chart I where the national

Factory Production

and Charles R. Downs



income in billions of dollars (Graph A) is plotted against the percentage of income received by the farmer (Graph B).

For reference purposes the income in billions received by the farmer is shown by Graph C covering the period from 1909 to 1932.

Chart II compares industrial labor rates and farm labor rates, both as index numbers on the basis of 1913 as 100.

The data for these charts were taken from various sources and are believed to be reasonably correct. At least they are comparative.

Chart I shows very clearly that gross income increased rapidly for both farm and national classifications for the period of 1909 to 1920 while the percentage received by the former was fairly constant at about 20% of the total income. After that, the fall in farm income was disproportionately large in relation to national income and in the succeeding years, when the national income increased rapidly, the farm income was relatively stable so that there was a continuous decrease in its relative proportion from 1921 to 1929. During this period, the farm income decreased from an average of 20% to less than 13% of the national income. During that period farm difficulties strangled farm buying power, but the full effect was undoubtedly delayed by increasing indebtedness.

The same general relationship is shown by Chart II. Up to 1920, industrial labor and farm labor maintained their relative position. In 1921 farm labor fell far below industrial labor and has never recovered its relative position.

Obviously, the system is out of balance. It is also true that much of the fault can be ascribed to the farmer himself. Agricultural production was not regulated from within, partly because output could not be accurately calculated in advance and partly due to the shortsightedness of the farmer. As a result, over-production made the tariff on farm products inoperative and prices were set, not by domestic demand, but by world prices. In the last few years, fertilization, pest destruction, favorable weather and foreign embargoes have all combined to create surplus stocks of farm products and intensify the unbalance.

Balance cannot be restored by bringing industrial labor and national income to still lower levels, since farm labor and farm income would follow a similar course. This result would reduce the farmer to a subsistence level where he provides no market for manufactured goods. At present, he is very close to that point. The process has already progressed far enough in this direction to show that a continuation would bring bankruptcy to all who so far have survived. To restore the balance, farm purchasing power must be restored by some means which does not likewise cause an equivalent rise in the price he has to pay for industrial goods. Inflation by debasement of the currency cannot restore the balance between the farmer's income and expenses other than helping him to retire his fixed indebtedness.

The farmer has voting power and wants a new deal and undoubtedly will get help from Washington. We should and must give him relief but we should be as sure as possible that the method selected will function with the least harm and disturbance to the rest of the country.

Most foreign countries have taken some measures to support the price level of home grown agricultural products. These measures take a variety of forms; in some cases centering around import restrictions such as tariffs, import licenses, import quotas and milling and mixing regulations. Some countries have put such measures under the guise of sanitary restrictions. In other cases, export restrictions have been imposed to raise world prices. In still others, we have export bounties and in not a few cases, direct aids are given in the form of production bounties and premiums. The problem in each country is different; hence the variety of plans in force.

All these measures have intensified the United States problem, since insofar as they have been applied

to products grown in the United States, they have tended to reduce the export market available for our products and further to make sharper competition between our products and those of other countries in such markets as remain open. This has contributed in no small degree to the fall of United States domestic prices for farm products. So far we have adopted no defensive measures except those of the "late" Farm Board, and although the seriousness of the situation has been recognized, action has been slow.

To produce the best results, a farm relief program should meet several criteria. It must give purchasing power to the farmer by raising the comparative level of agricultural prices. It should be direct and immediate in its effect. It should be capable of administration without an extensive, expensive organization. It should not contain prohibitory features that in the end result in the corruption of the supervisory functions of government employees. Finally, it should not encourage the production of agricultural products to increase far beyond our domestic needs and those of the unobstructed export market.

Equalization and Debenture Plans

Among the early proposals were the McNary-Haugen equalization plan and the debenture plan involving the raising of domestic prices to an arbitrary figure (the world price plus the tariff) and the dumping of surpluses abroad. The sale of surplus abroad would be carried on by the government or through the recognized agencies and since the exporter would buy at a high domestic price and sell at a lower export price, a loss would result on the surplus so sold. In the equalization plan, this loss was to be carried by a fee assessed on the benefited farmers. In the debenture plan, the loss would have fallen on the taxpayers. Either way, the farmer would have been spurred to increase production as far as possible for his net return per unit was fixed. The equalization plan penalized him somewhat for increased production but not in proportion to his gains.

Recently the "Domestic Allotment" plan has had great publicity. This involves a sales tax imposed on the first processors of agricultural products. Receipts from this sales tax are to be returned to those farmers who reduce their acreage by an arbitrary amount, usually stated as 20% of the average of the last five years. The amount of the tax is to be calculated from time to time so as to reestablish the relation between industrial prices and agricultural prices which existed prior to 1914. The big objection to this plan is that it would stimulate farmers to produce the maximum yield possible on the remaining acreage since at all times they are guaranteed a unit price. This might well mean an actual increase in production through intensive fertilization and favorable weather rather than a decrease which is the ostensible purpose. The administration of the plan, the determination of the five-year average production base for each farm, policing to see that acreage is reduced, and the handling of the bonus returns, all make for a complicated and costly organization.

Another method proposed is the "Leasing Plan." As with the Domestic Allotment plan, a tax is placed on the first processors. The proceeds however are used to lease marginal lands and keep them out of production. This also is complicated in administration especially to determine what lands are marginal. Then, too, the incentive is strong to produce to the limit on the lands cultivated. Land taken out of production in one state might be accompanied by an increase in land used in another state. Moreover, as the land leased is marginal, the decrease of crops will not be proportional to the land removed from production.

Along with this last plan, a special method, the Smith plan, has been suggested for cotton which involves the use of the Farm Board's cotton holdings. Planters are to reduce acreage 30% without increasing fertilization on the balance. In return they are to receive an option to purchase Farm Board cotton at present prices to an amount equivalent to the percentage reduction of acreage. One difficulty here is that the least productive land would be allowed to lie idle and hence the reduction in crop would be less than anticipated. For this particular crop, cotton, however, the Smith plan seems to have many points of merit since it does not involve new expenditures by the Federal government requiring new taxes. It does however, require policing by the Federal government to see that acreage reductions are carried out, and, what is far more difficult, that surreptitious fertilization is not practiced.

Crowther Plan Appears Feasible

Another plan, described by Samuel Crowther in the *Saturday Evening Post* would prohibit the importation of all competing agricultural products with the Secretary of Agriculture allowed to permit importations in the event of a crop failure. Before each planting season, the Secretary would set a domestic quota for the various crops based on the past records of production and domestic use. A minimum price, stated as roughly the world price plus the tariff, would be set for the domestic quota and the balance would go out at world prices. For cotton, the plan would require a tariff since there is none at present on this commodity. Crowther further suggests the prohibition of exports of all raw agricultural products so as to encourage their fabrication in United States factories and restrict the exports to manufactured products, thereby increasing the employment of our labor. It appears to us that the Crowther plan has simplicity but that it does not deter over-production. If the farmer can grow more product, the excess, at world prices, is added income at little added cost and might well result in extremely large carry-over crops which, even at low world prices, imposes a large burden on someone, presumably the government.

All these plans feature a fixed price per unit of product. Thereby they encourage over-production without adequately penalizing it.

If we dismiss the idea of unit prices and substitute the principle of providing the farm population with an adequate total income in proper balance with the national income, the problem is simplified. This appears to us to be the proper objective. This means assigning a desired value for a crop as a whole and no attempt to set prices per pound or per bushel without regard to the amount of production.

Simple Plan of Administration

Farm income is now around $5,000,000,000, about 12% of the total national income. Back in the period 1921 to 1929, it ran about $10,000,000,000 per year and varied steadily downward from about 18% of the total to its present level. Over the period 1909 to 1914 when affairs were well stabilized, farm income kept in step at around 20% of the total income. We cannot restore farm income intelligently on the basis of gross dollars alone; it must be on a combination of gross dollars and per cent. of the total.

To make farm income again 20% of the present national income would involve an increase in gross returns to the farmer of about $2,500,000,000. This is probably the maximum we could do in our present situation and admittedly it would be some hardship to consumers. We will however, have to swing somewhat beyond the farmers' fair share to reverse the downward spiral of the last 3½ years. When total national income increases, the percentage may decrease while actual dollar returns to the farmer should increase so as to maintain the balance and achieve stabilization.

The mechanics are simple. Embargoes would be placed against the import of all competing farm products. The Secretary of Agriculture would divide the total income allotted to the farmer to the various crops on the basis of past statistical information. Then, on a specific crop, a minimum domestic price per unit would be set on the basis of the expected harvest, domestic consumption and price in unrestricted export markets, which would bring the total income desired from the crop. It would be unlawful for any person to purchase from any agricultural producer, or for any producer to sell at less than this minimum price. The set price per unit would be changed at monthly intervals to adjust it to changing estimates for the crop volume and thereby avoid wide fluctuations.

As world prices fell, the domestic unit price would rise and the farmer's income would not change. Even when no export market existed, and there was an excess production over domestic needs, the excess would be carried at zero value and therefore would not involve financial charges for the carry-over. As world export market prices increased, the domestic unit price would be reduced automatically in a related proportion and the consumer would benefit. Under the unusual conditions of possible foreign shortages and soaring world prices, so that world prices exceeded the set domestic unit price, export embargoes would be imposed on all but our excess over domestic needs.

The Secretary of Agriculture would be empowered to lift the import embargo when there was a serious crop failure or in case the farmers were slack in producing domestic needs. Only in this last case would they suffer a proportionate income reduction. A flexible tariff for such permitted imports would keep the domestic unit prices stabilized.

With advantage, the idea of exporting finished products rather than raw materials could also be added. In that case, prices to processors for export would be adjusted so as to give them raw materials at such rates as would permit their finished products to compete in unrestricted markets with similar world products made with much cheaper labor. This would not unduly increase the dollar volume of our exports and would materially increase employment in the processing factories. The farmer would not be hurt and industry would be tremendously stimulated.

This plan is simple of administration and involves no elaborate organization. The government would not have to police the farmer to keep production in bounds. The farmers themselves and public opinion would police the individual. The expense to the taxpayers would be negligible. It is more than an emergency measure. Wisely administered on the basis of good statistical information, we believe it could act as a continuous balance wheel to regulate internal fluctuations in the flow of goods between the two major producing groups, the farms and the factories. By maintaining this balance, the extreme peaks and valleys which have characterized our economic history might be eliminated, certainly insofar as agricultural difficulties have contributed to the present state of affairs. The strangulation of our circulation could be prevented and we could grow sanely and steadily toward higher standards of living for our entire population.

Aluminum Industry in Russia

The Volkhovsk works, the first aluminum works in the U.S.S.R., at present partly under construction and partly working, produced the first lot of aluminum last May. The capacity of the works is to be 12,000 tons of aluminum a year against 5,000 tons. The Dnieper aluminum plant at Kichkas (Ukraine) to have a still greater output, is being constructed at full speed, and, when completed, will produce 40,000 tons of aluminum a year. It will be the most powerful plant of its kind in Europe and second only to the Arvida works in Canada. It will also treat Tikhvinsk bauxite. Most of the equipment of this plant is being made in the U.S.S.R., while the Volkhovsk works are entirely equipped with imported machinery. Construction of a third large plant will be started at Sverdlovsk in 1934. This plant will probably produce 50,000 tons of metal aluminum a year. A test plant for extracting aluminum oxide from clay (with the aid of acids) is being constructed at Moscow. By the end of 1937, it is planned, the aluminum industry of the U.S.S.R., will exceed that of any European country and take second place in the world after the United States.

Alcohol from Wood*

A Description of the Scholler Process Now Working in Germany

By Alfred Hurter

IN THE second decade of the last century, the French analytical chemist Bracannot succeeded in completely converting cellulose into sugar by means of treatment with concentrated sulfuric acid. His discovery created a great sensation scientifically and economically. But Bracannot's technical achievement did not prove a success. The very considerable consumption of acid and the difficulty of recovering the same while working with high concentrations, bar the economic utilization of this method.

It was only in the year 1856 that new epochs in this development of the saccharification of cellulose are recorded. In the same year, S. F. Melsens reports experiments for the saccharification of cellulose with diluted acids combined with heating. He required considerably less quantities of acid but his quantitative results were so insignificant that his process failed to attain economic importance. Almost simultaneously, Béchamp described the effect of concentrated hydrochloric acid. Subsequently Dangevillé (1880) evolved a new procedure: the saccharification of cellulose with concentrated liquid or gasiform hydrochloric acid at low temperature obtaining satisfactory output, allowing also the recovery of the hydrochloric acid by distillation. The technical difficulties in connection with the distilling of concentrated hydrochloric acid frustrated Dangevillé's efforts and his process was soon forgotten.

The saccharification with diluted acid was further developed 18 years later, in the year 1898, by the Swedish scientist E. Simensen, and in the following years became the subject of numerous works by others. Ewen and Tomlinson, in 1909, in the United States, brought out an industrial process of saccharification with diluted acids. Their consumption of acid was reasonable, but their output was as insignificant as their predecessors'. They secured only about six litres of alcohol out of 100 kg. of dry wood substance. Nevertheless, their process must, at that time, have been on the borderland of economy, for when the factory in Georgetown, S. C., was burned down in 1913, new works were erected, which are said to have been running until 1916.

According to Bracannot's process, a sugar output of 60 kilograms, corresponding to a spirit output of about 30 litres, should be obtained from 100 kilo of wood. One wonders, therefore, that a process for the manufacturing of alcohol from wood has been employed, which only yields one-fifth of this output. This, however, finds its explanation in the important technical advantage obtained by working with diluted acids as against working with concentrated acids. Whereas the process working with concentrated acid necessitates four periods, i. e., the drying of materials, the treatment with concentrated acids, the recovery of the acid and the converting of the carbohydrates into a fermentable state, one can, by the use of diluted acids, in one single process, obtain fermentable sugar from moist or even wet cellulose material. The recovery of the acid is unnecessary, as the small amount of acids required can readily be abandoned. In the meantime, in Germany in 1913, Willstaetter, Zechmeister and simultaneously Wohl, discovered the action of over-concentrated hydrochloric acid upon cellulose, whereby the saccharification with concentrated hydrochloric acid attracted renewed attention.

During the war, Germany required large quantities of sugar for the preparation of glycerine. The consequence was that the manufacture of sugar and alcohol from wood was practiced on a very considerable scale. Diluted acid was used according to the processes developed by Simonsen, Classen and Ewen and Tomlinson, and factories were erected in many places. From August, 1918, to September, 1919, the total output of the Stettin works amounted to 150,000 litres of alcohol. But, as in America, 100 kilograms of dry wood substance yielded only six litres of alcohol. All through 1919, the attempt was made to keep the works going, but the insufficient output proved to be economically unsound. In consequence of these failures, the saccharification of cellulose with diluted acid was generally looked upon as uneconomical. This opinion was upheld among others by Prof.

*Abstracted from Canadian Chemistry and Metallurgy.

Bergius and shared by Hagglund in his book "Holzchemie" (Wood-chemistry) 1929, (page 183). It was considered impossible to increase the output by any technically practicable means.

After the war, research on saccharification with concentrated hydrochloric acid was taken up with renewed zeal. Notable outputs and the possibility of the recovery of the acid acted as a stimulus. In accordance with Willstaetter's results, Hagglund, Bergius and their colleagues worked out the "Rheinau" process, while the "Prodor" process of Levi and Jerrisse may be looked upon as the continuation of Dangevillé's work. Both the "Rheinau" and the "Prodor" processes were put into operation at Geneva, Switzerland, in 1927 and 1928, but the manufacture was again abandoned, since when no other similar works have been erected. H. Scholler, in Prof. Dr. Lüers' laboratory, during the years 1922 and 1923, ascertained that the poor output to date was fully explained by the decomposition of the sugar already formed.

"Pressure Percolation"

Only as recently as 1926, Scholler discovered means and ways, whereby the most disturbing decomposition of sugar during the process was eliminated, and thus a big output of sugar was rendered possible by saccharification with heated diluted acids. About 170° C. of hot, slightly acidulous water flows continuously and comparatively quickly under pressure of about 8 atm. (119 lbs.) through the cellulose material, thus carrying away the sugar which is being formed during the saccharification process from the apparatus where the reaction takes place, leaving, so to speak, no time for any decomposition. As soon as the sugar solution has left the apparatus, it is cooled, so that further decomposition is avoided. This new method is called "pressure percolation" with diluted acids. In order to guarantee success, the temperature, the concentration of acid, the time of reaction and the swiftness of the flow must be well balanced. By this means 100 kilogs. of soft dry wood substance will yield 25 litres of 100% alcohol (corresponding to 42 gallons per ton).

Since the beginning of 1928, the process, conjointly with the Tornesch distillery, was step by step developed industrially, and at the end of 1930, the first large factory of this kind, opened at Tornesch, proved a complete success. The scientific experiment had been transferred successfully to the industrial stage.

The raw material used in Tornesch consists of woodchips, sawdust, shavings, machine-shavings and raspings. This (soft-wood) material yields, as already mentioned, 25 litres of 100% pure alcohol per 100 kilos of dry wood substance. Naturally, the output fluctuates according to the kind of raw material subjected to the saccharification process. But it is interesting to note that the bark of trees, otherwise almost totally useless, still yielded about 17 litres of 100% pure alcohol per 100 kilos of dry wood substance.

Based on the estimate of a factory of 60 tons daily consumption of waste wood, a careful calculation, including reasonable overhead charges, 6% interest on invested capital for the installation of the factory and 9% annual depreciation of the machines, the cost price of one litre of 100% pure alcohol is less than 20 pf. (corresponding, at par, to 24c per gallon). As, however, in above calculation of the cost price of the alcohol produced, the raw material (the waste wood used) is priced at 20 marks per ton, or fully 40% of the cost of the alcohol, the latter is considerably reduced as soon as the raw material can be procured at a lower cost.

A great advantage of the process is that its technical simplicity also enables comparatively small establishments to work advantageously. In countries where high freightage on wood is a consideration, it is of importance to be in a position to carry on the production by numerous de-centralized smaller works.

There is also no necessity for the raw material used for saccharification to be completely split into small pieces. For instance, it does not matter if larger pieces of wood are put into the percolators, as long as such pieces are embedded among smaller bits. The raw material also need not be dried; it can even be filled into the percolators in a wet state.

In addition to the production of alcohol, about 60 kg. of 50% water-containing lignin per 100 kg. of dry wood substance are obtained. For the time being, this lignin is consumed at Tornesch under the boiler. This fuel provides the greater part of the necessary heat and energy for the process, including the fermentation and distilling. The lignin in a dry state has a heat value of about 6,000 (metric) cal., and is easily ground and formed into briquettes. It is practically free from ashes, ignites easily and is also suitable for gasification.

The possibility of producing yeast on a large scale as a highly albuminous cattle fodder may also be pointed out. The sugar worts from wood form an initial material for yeasts. By adding nitrogen and phosphates, the economic production of easily digested albumen is ensured. In places where corn can be produced cheaply enough in great quantities, the process can also be advantageously combined in such a manner that, by means of a mash-process, sugar worts are produced from the sweet corn, but also by saccharification of the otherwise useless stalks and leaves of the plant, according to the Scholler process. It may also be mentioned that other industrial branches, dealing with the production of lactic acid, butyric acid, citric acid, glycerine and similar articles, may be related definitely to lower-priced alcohol.

The ideal arrangement would be the complete technical utilization of all wood and lignin components, which, for the time being, are simply used as fuel. That would mean the crowning of Scholler's successful, extremely interesting and promising process.

An "I.-G." Executive

Appraises World Trade

in Terms of Debts

By Councillor Dr. Hermann Schmitz
Director of I. G. Farbenindustrie A. G.

In view of the recent international and financial developments what an important German chemical industrialist thinks of the world trade situation is of more than passing interest and we are glad to reprint this abstract of Dr. Schmitz's article from the British Trade Review.

GENERAL and deep-seated economic troubles like the present crisis are but the concomitants, or the results of great political upheavals, and are therefore incapable of explanation by the usual theory of economic cycles or of automatic improvement by the operation of inherent forces. During the last century similar crises arose in Europe, after the Napoleonic wars, and, to a smaller extent, in America after the Civil War.

The causes, symptoms, effects and reactions of such world economic "readjustment" crises are so many and varied that it would be quite impossible to deal with them individually. However, these factors become concentrated as though in the focus of a lens as soon as we attempt to grasp their ultimate influence on the interlacing of international capital, and the balances of the individual countries.

The U. S. A., which before the war was a debtor country with a very favorable trade balance, has since become the chief creditor of the world. On the other hand, the European countries which formerly received, by way of repayments and interest on loans, a considerable proportion of the raw material and food produced by the overseas countries, are today both politically and commercially deeply in debt and, in normal circumstances, could only wipe out their debts by the export of industrial commodities.

Striking a balance between the foreign credits or debts, and the gold and currency reserves held by the issue banks of the leading countries, this financial reshuffling may be expressed in the following figures: The U. S. A. has today claims amounting to 22,000 million dollars, as against a pre-war debt of 2,000 million dollars; Germany owes 5,500 million dollars, as against a pre-war credit balance of approximately the same amount; England is a creditor, taking into account the depreciation of the £, to the extent of 12-14,000 million dollars, instead of 18,000 millions; while France, owing to her loss on the Russian loans, has a credit balance of 4,000 million dollars, instead of 8,500 millions. This represents a gain of 24,000 million dollars for the U. S. A., a loss of approximately 10,500 million dollars for Germany, an estimated loss of 4-6,000 million dollars for England, and a loss of over 4,000 millions for France.

It is quite evident that this reversal of the tide of payments from Europe to America ought to be accompanied by a reversal of the flow of commodities toward the U. S. A. Statistics show that such a reversal has already taken place, though in such a haphazard manner as to throw into confusion the entire world economy. In view of the Lausanne negotiations it is superfluous to enlarge on the very injurious effect in this matter of the reparations payments, and the financing thereof by foreign credits.

The efforts of the European debtor countries to secure the means to meet their obligations through the creation of a favorable balance of commodities and services have led the world by two different routes to the intolerable deflation which has made impossible the final settlement of all international debts. The throttling of imports of raw materials and foods has been one of the principal causes of the unprecedented slump in the raw material markets, and, in particular

has made it impossible for the South American, African and Asiatic debtor countries to maintain their regular interest payments. The simultaneous pushing of exports has added to the deflationary pressure from the industrial side, upsetting the payment balances of the creditor countries, which have already suffered through loss of capital and interest on their foreign investments.

The European debtor countries—Germany, Italy, Poland, the Austrian successor States, the Balkan and Baltic countries—improved their commodity and services balances by 1,500 million dollars between 1928 and 1931, whereas during the same period the commodity and services balances of the European creditor countries—England, France, Belgium, Holland, Switzerland, Sweden—deteriorated by over 1,000 million dollars, that of America by 500 millions. But that of the South American, Asiatic and African debtor countries also fell, by a similar amount. During the same period the interest revenue of the creditor countries from the European debtor countries rose by about 250 million dollars, against which losses amounting to 750 million dollars were incurred in South American, African and Asiatic investments. This development, which was accompanied by the most disastrous deflation, currency and trade crisis in economic history, clearly shows that the attempt of the European debtor countries to meet capital and interest payments on their political and commercial debts in order to satisfy principles of honor and justice, has necessarily endangered the capital invested by their creditors in other parts of the world, and that it is in the interests of both debtor and creditor countries to find an economically rational way out of this dilemma.

It is understandable that the question of international indebtedness assumes a variety of aspects according to whether it is viewed from America or from Europe, from the angle of industrial policy, bank balances or State finance, and that the solution is also rendered more difficult by economic ideology. Nevertheless, it must be recognized that the problems of political and commercial indebtedness, of international trade relations, of State finance and currency reform, constitute a single indivisible unit in any consideration of the future development of world economy. A World Economic Conference that fails to deal with these difficult problems will have failed to deal with the most urgent problems in the life of the nations.

Care of Grinding Machinery

By F. W. R. Williams, M. Inst. M. M.

Manufacturers of crushing, pulverizing and screening machinery are numerous. There are concerns who have specialized in this direction, whose names are synonymous with machinery of the first order, but there are others who have come into it who cannot have had the experience to insure that money will not be wasted, all in due course. What then are the points to be observed so that those, who have the responsibility of the maintenance of such machines, may be on the lookout to see that money is not wasted in upkeep, in losses by unnecessary wear and tear, and by unhealthy conditions for workmen?

The conditions which are to be met with should be well understood. Then see that all parts of plant are accessible. This does not mean that the parts of the plants should be necessarily exposed, but rather that they should be readily "get-at-able" so that if any congestion occurs it can be rectified and if the plant is a well balanced one the difficulty can be readily overcome. The "open door" feature is desirable and saves time and temper.

Another important feature in any crushing and screening plant is that it should be practically dustless. This is one of the most important conditions which should be insisted upon. To this end, apart from the fact that all dust-producing machines should be under suction, vacuum cleaners are important adjuncts and quickly pay for themselves; in addition to being ideal cleaners of dust they also have ventilating effects. The question of lubrication is also very important, for different types of machines require different grades of oil and of grease. There are so many types of bearings used that it is advisable for users to ascertain from the makers what particular grade is recommended.

Expecting Impossibilities

Take a general view of the machines used in this branch of industry and the why and wherefore such a machine is used so that expenses are not frittered away in attempting the impossible. The most usual error is to expect a machine to work far beyond its limits, that is to say to attempt to reduce in a single machine pieces of material from the size of a head to impalpable powder. This, of course, is an impossibility, and if it were possible a mechanism having such a range would be most expensive and one which would certainly give trouble. Another very usual error is to look for a machine which will handle large lumps and reduce to small pieces in one operation with a capacity of a few tons hourly. The capacity and power, it must be remembered, are measured by the feed and discharge openings and the strength must be in proportion to the size, hardness and weight of material being handled. The most important consideration in the reduction field is to distinguish the character of material to be crushed.

These remarks are made to show that if a plant is not adapted for the economical production of the material which has to be dealt with, it is impossible to treat the question of maintenance seriously. Fortunately, today it is impossible to obtain machinery admirably designed and constructed, where the surrounding conditions are the same, but nevertheless one still finds crushing, pulverizing and screening machinery which have been obtained from constructors with limited experience and the result is apparent to everyone.

Taking the case of elevators for example, how seldom it is that you find one doing its work noiselessly and without dust pouring out from every joint? Such a state of things is not necessary. Again with regard to screens, how often do you see them working unless it is in a cloud of dust? The writer was recently visiting a quarry which was situated in a rural district, where the whole countryside was covered with a white pall of dust. The cause of this could be ascertained without leaving the highway; it was due to a quarry plant situated about a hundred yards from the road. The noise of the crushers could be heard as they crushed the rocks; the crushed stone fell into an elevator—open to all the winds that blew—which discharged into some trommels and some screens about fifty feet above ground level. These screens were totally unprotected from the wind, and the clouds of dust which were created, was the cause of the complaints of the villagers in the hamlet half-a-mile away. When one mentions the word maintenance under such conditions it seems almost a mockery.

To sum up this question it resolves itself into one of purchasing such machines from makers with recognized experience and following their instructions. Then, in this field of endeavor, more employees will be working under better conditions than they are at present, and silicosis and kindred ailments will disappear.—*The Chemical Age.*

Efficient Layout of the Plant Laboratory

By W. Henry Ibbotson

ANY works laboratory is the technologist's workshop and the essential nerve-centre governing efficient operation, and as such is worthy of detailed consideration when being erected and equipped. In our more or less enlightened day this consideration is more often given than formerly, but the impression gained by visits to some industrial plants, notably those of long establishment, is that works laboratories are often just places in which chemists can struggle along with their work under distinctly adverse conditions. No excuse need be offered for stressing the importance of these points which affect the direct usefulness of the chemist's work. It may, of course, be assumed quite naturally that the manufacturer employing a chemist appreciates his function, otherwise he would not be employed, but does he in every case equally appreciate how by inadequate provision the chemist's efforts can be in large degree nullified? If he does not, then any plea for his consideration cannot be considered ill-timed.

In any scheme for laboratory installation, first principles of chemical manipulation must receive primary consideration. Cleanliness is, of course, of major importance. Unfortunately, works conditions in many industries militate against the achievement of the ideal in this direction, but where general conditions are bad it is often possible by judicious selection of situation and construction to achieve something rather better than the worst, to say the least of it. Secondly, an equable and constant temperature is to be sought together with maximum of daylight without direct sunlight. Further, if these important standards can be satisfied together with easy access to manufacturing and administrative departments, so much the better. Where possible then, the laboratory should rank at least equally with any other essential part of the works in the layout.

In discussing these first principles, sight must not be lost of the specific function of the laboratory in the particular works contemplating installation. While general requirements as already enumerated must as far as possible be borne in mind in all cases, certain types of laboratories call for special consideration and particular design, providing in each case for peculiar requirements. Many instances come at once to mind in which this observation applies, and in some measure it is proposed to discuss these with consideration of points which have a general application.

There are, indeed, some most desirable standards at which to aim with all works laboratories, and keeping these in mind, one is led to ask what is the ideal situation. As cleanliness is to be studied, a position must be sought where the dirtiest part of the works will not deposit a moiety of its discharge; the direction of prevailing winds observed; and loading and unloading processes on the doorstep, so to speak, guarded against. Daylight, too, being most highly desirable, the laboratory therefore will be better situated where it will not be overshadowed by high plant or other buildings. In this connection it might be mentioned that maximum suitable light will be obtainable by arranging for windows in the contemplated structure to face North or East. One further point to bear in mind is that a situation which will be subject to vibration is most certain to prove objectionable as a site.

The standards enumerated can often be satisfied quite satisfactorily when the laboratory is embodied in a complete plant layout without sacrificing accessibility to manufacturing departments and administrative quarters. Where this wholly desirable combination cannot be carried out in entirety, a reasonably happy medium can generally be arrived at. There is, however, the case of the older works which may lack space for expansion and the erection of additional buildings. In such a case, adaptation must be allowed to play some part, and then, maybe, the ultimate result will not be so satisfactory as when complete building from foundations up can be resorted to. Even, however, when expediency triumphs over desirability, some measure of discretion can be brought to bear, and ideal conditions approximated to as high a degree as possible if only by additional constructional detail applied to that end. If a choice of existing buildings for adaptation exists, selection of those available may achieve something approaching ideal with elimination of the obviously unsatisfactory.

The next obvious step is to consider suitable types of construction, dealing first of all with features of general application. As vibration must be guarded against, sound foundations are a vital necessity when erecting the complete laboratory, the precise nature of these depending on the nature of the ground at the site. In most cases, deep-laid concrete will be found advisable. It need hardly be urged that adequate damp-coursing should be put in and under-floor ventilation provided for, to prevent undue humidity prevailing. If it happens to be a case of adaptation and these points have not previously been attended to in the building as erected, some measure of underfloor ventilation can often be introduced.

Continuing upwards, wall structure demands consideration. Brickwork of normal type at once suggests

itself as being eminently suitable. If thought desirable from the nature of the work contemplated, say from considerations involving the addition of further floors, steel sections may be embodied. In this case, however, it will be found advisable so to dispose these as to preclude exposure of steelwork to fumes of a corrosive nature which may be generated in the laboratory itself. For this reason, beams and purlins should be executed in wood. Steelwork so embodied may be of channel section in which electric wiring conduits conveying current to the laboratory may be sunk, the conduits and channel being covered over by glazed bricks. For obvious reasons it would be unwise to use such channels for gas and water services. One sometimes sees laboratory buildings erected in reinforced concrete, usually when considerable portions of the works are constructed in this way, and this serves well where the general atmosphere is not of a destructive nature, provided due care is observed when building to provide suitable indoor facing. Whatever form of construction be adopted, the axiom of maximum light must be followed. Therefore, the architectural layout should provide for ample window space at such a height as to provide maximum daylight at bench level, the framework being of either wood or metal and if possible incorporating ventilators. Roof lights are sometimes used but this form of lighting is not by any means the best, having a tendency to admit too much variable direct sunlight in summer and to act as moisture condensers in cold weather. If used, they should preferably be of some type of obscured glass, cast or rolled plate or in hammered patterns.

Ample height should be provided from floor to ceiling and the latter should conform to the roof with means of ventilation provided at the highest point if possible. These remarks apply of course most particularly to the laboratory proper itself, and any projected adjuncts such as laboratory office, cloakrooms and sanitary arrangements may be disposed as convenient, with the proviso that the balance room, which it is certainly advisable to separate from the main laboratory should be regarded as calling for the highest consideration.

Flooring

The flooring of a laboratory requires serious consideration. Concrete is occasionally used, but this is far from being a suitable material, being dusty unless finished in a manner which renders it slippery and trying to the worker. Furthermore it is noisy, sufficient condemnation to many people. Where, however, concrete construction recommends itself to the designer of the complete building, the trouble can be obviated by covering the concrete floor with linoleum or rubber sheeting. Wooden floors are the more usual practice and are very suitable, the precise form being usually a matter of choice and of the expense it is permissible to incur. One type of suitable floor which will certainly grow in favor is that which having a wooden basis, is finished with jointless magnesite composition or similar suitable material. This type has the advantage of being easily washed—in fact if care is taken in laying, it can rapidly be cleansed by hose and squegee, a small drain being located in a corner to conduct away washings.

Walls

Now the question of wall surfaces arises. A light-colored surface certainly assists in natural or artificial illumination. White paint for ceiling and walls represents a suitable medium, but in this case it should be zinc oxide or other non-darkening paint—white lead rapidly discolors in almost any laboratory. Some prefer an internal facing of white glazed bricks or tiles, and this surface has the advantage of being easily washed without any loss of whiteness. Any painted surface gathers dirt and requires ultimate renewal after a period of gradual darkening, and should any considerable quantities of corrosive fumes be emitted, white tiling is certainly advisable. It is however an expensive medium to employ, though it need not be used for the whole wall surface as match-boarding painted a dark color may be satisfactorily employed from the floor to a height of about 5 ft. The use of this latter method provides a light reflecting surface in the part where it is most needed with economy in the decorative scheme. In many cases a complete lining of match-board can be successfully employed, this being painted white or a light color with the exception of the lower part. In other cases plaster walls will be quite suitable and these can be covered with a good water-paint.

General laboratory efficiency may be enhanced considerably by the most suitable disposition of the balance-room, etc. It has already been mentioned that the provision of a separate balance-room is advisable. The reasons for this are too obvious to require reiteration. It should be situated if possible so as to open off the end of the laboratory itself. In this way, if glazed partitions of generous proportions are employed, maximum light is obtained while dust and fumes are excluded. This latter point is important in all classes of works, and in steelworks, particularly, it is imperative; and at the same time easy access is obtainable. The office may, if necessary, be incorporated in the balance-room, although if space and other considerations permit, it is good practice to treat it on similar lines to those quoted for the balance-room. Cloakroom and sanitary offices can be disposed as convenient, isolated from but adjacent to the laboratory.

Where crushing and grinding of samples is likely, such as preparation of samples of ores, coal, coke and minerals, it is necessary to guard against vibration and dirt by providing a separate sampling room. Similarly, mechanical testing departments should be

isolated. Works with any appreciable number of pyrometers and recording instruments in use, will find it advisable to add a small room for the service and storage of records of these.

These details, of course, apply to specially planned and built laboratories and are of general application. It has been so far inferred that ground floor construction is called for and it is certainly an advantage to follow this plan where works accessibility is a consideration. It is, however, common practice to build additional stories to accomodate research laboratories and there is nothing deleterious in this. Occasionally, too, the necessity for adaptation renders the use of higher floors necessary. Here the only drawback may be the consequent necessity for frequent ascent of stairs and this may need to be tolerated when new construction is out of the question.

Furnishing

The details of furnishing must, of course, be governed, above all, by the nature of the work to be carried out. Some industries call for special consideration. Fume-cupboard disposition provides a case in point. In most laboratories one of large size, located in a corner, will suffice for most needs. In a large metallurgical works covering a comprehensive range of products and requiring examination of a similar range of materials, the laboratory fume-cupboard provision will be best made on a generous scale.

Cupboards and shelves for materials and apparatus to be used on the bench should be disposed with consideration for their precise utility in the case in question. The only general rule which can be laid down in their case is that they must not be so set as to offer hindrance to the operations most likely to be carried out on the benches in question. Likewise, bench accommodation must bear some relation to special requirements. Generally, long benches, 3 ft. to 3 ft. 3 in. in height, conforming to length or breadth of the laboratory will be found useful, but where distillations of inflammable liquids and extractions are contemplated it is better to install special short benches for this work. The material for benches is usually wood with a preference for teak, but this is not ideal for special classes of work. Deal-framed and topped benches covered with light sheet chemical lead present a far more serviceable arrangement for use with acids and many chemical products, and for this reason many chemical works laboratories are equipped with this kind of bench. Lead, however, it should be noted, is not a suitable medium to employ in certain chemical industries using organic bodies which combine with lead to form explosive compounds. The use of asbestos-cement tops for benches also finds favor in some quarters. Stone, slate, or concrete slab tops are probably the most suitable for benches on which muffle or combustion furnaces are to be mounted. Whatever type of material is selected as being most suitable for benches for the specific work of the laboratory, benches should, if possible, be constructed on a "clean top" plan—that is, clear working space unhindered by fittings should be provided. Gas and water services can quite easily be disposed at the extreme back of the bench, or, alternatively, gas services be brought up through the framework with cocks fitted under the front edge and water supplies at the bench ends. Sinks can with advantage be fitted at bench ends, preferably at the back when benches are built along the length of the laboratory wall. It is not unknown for benches which may be put to varied uses to have sinks fitted in such a manner as to permit of easy and quick removal to other points. In this case no permanent connection is made to drains, and they cannot be of sunken type, but must fit right at the end of the bench. It is also a practice in some laboratories to have an open gutter set along the back of the benches, this in turn leading to a drain. This, however, is hardly to be recommended for general adoption, being only suitable for benches on which chemicals may be lavishly and carelessly handled, thus giving occasion for copious washing down. It need hardly be said that trapping of all drains is advisable, and here burned joints will be found more reliable than wiped joints. Care should be taken in all cases to ensure adequate water supply with provision against frost when laying all pipes.

While discussing the installation of services, it might profitably be borne in mind that many laboratories often have occasion to use compressed air and vacuum. If, therefore, either compressors or exhausters are existent in the works, provision should be made to utilize these by pipe connections to one or more points in the laboratory.

The efficient illumination of laboratories is a point often neglected. No worker can carry on successfully if dazzled by either sun or artificial light. Therefore, windows upon which direct sunlight may fall should not be of clear glass. Various suitable forms of colorless glass are available in those types quoted for use in roof-lights. The sources of artificial light are, perhaps, more easily controlled, and if direct lighting is adopted the sources should be so disposed as to be directly over the worker's head, neither behind nor in front, nor too low, and if possible, adjustable for height. Indirect lighting is by far the best means from the chemist's point of view, however, giving even and restful illumination.

The chemist, being only human, feels the cold equally as much as any other unit of the industrial machine, and cannot do his work justice under Arctic conditions: however controversy rages about his soul, none will deny his body and its needs.

Finally, particularly in laboratories where inflammable material is used, adequate provision should certainly be made to guard against fire. Let the laboratory be the local headquarters of "SAFETY FIRST."

CHEMICAL

The Photographic Record

Men, if you would be comfortably clothed this summer try the new celanese suitings shown to the left. They combine comfort and practicality with coolness, and are another chemical industry contribution to the textile trade. Courtesy American Silk Journal.

Keystone Views

Secretary of Agriculture, Wallace, in recognition of the movement afoot in the Middle West to use gasoline blended with ten per cent. alcohol, pours ten gallons of the fuel into his car, while Representative Dirksen, of Illinois, author of one of the four alcohol blending bills before the House, holds the funnel.

Left, Sir Henry Dale, Director National Institute for Medical Research of England, principal speaker at the dedication of the new Merck Research Laboratory, defined the function of science as expressed by the old formula "the improvement of natural knowledge by means of experiment." Below, the new George Eastman laboratories of Physics and Chemistry of Massachusetts Institute of Technology made possible through the benefactions of the late George Eastman.

NEWS REEL

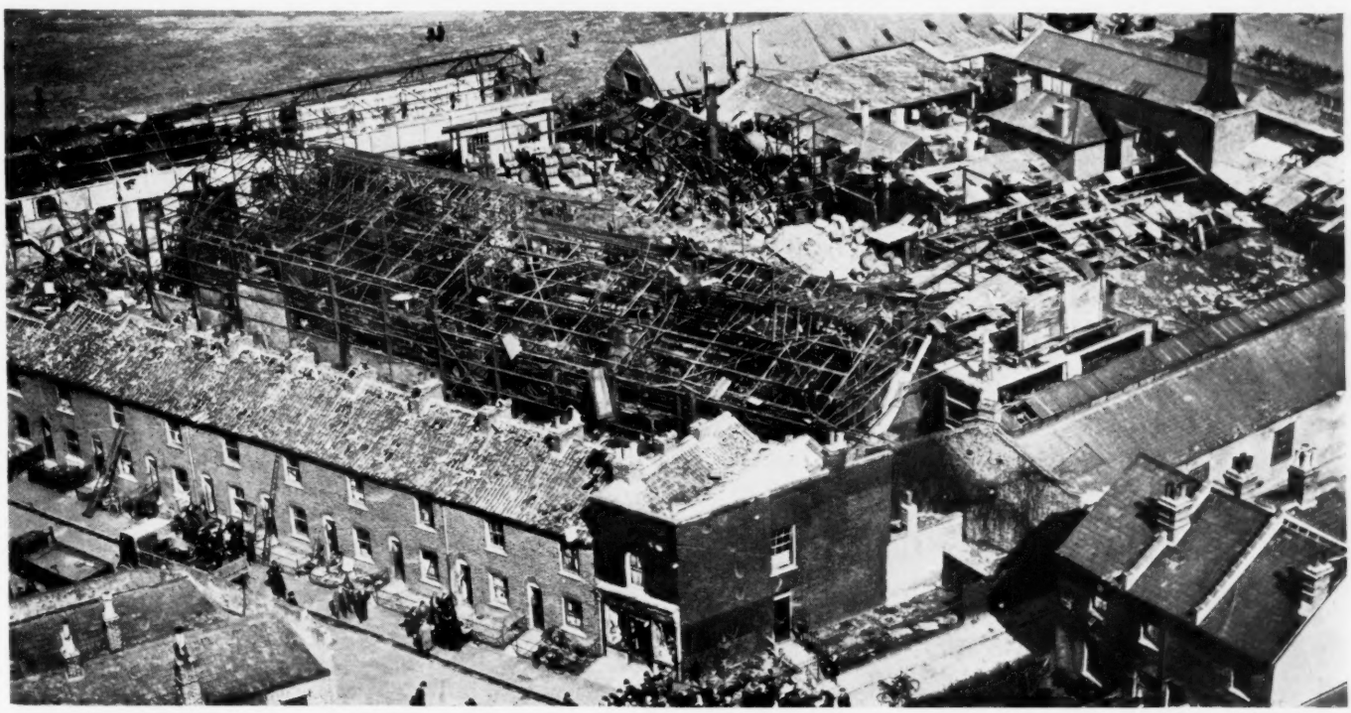
of Our Chemical Activities

Keystone Views

The "Polarograph," an invention which affords swifter means of chemical analysis than ever before attained, is also said to be practical in blood analysis, biological research and agriculture. Prof. Yaroslav Heyrovsky, inventor, of Charles University, Prague, recently demonstrated his invention at the California Institute of Technology.

Luther Martin, Wilckes, Martin and Wilckes Division Swann Chemical Company, President University of Pennsylvania Club of N. Y., upholds an old tradition of the club in honoring some outstanding University of Pennsylvania man at its annual dinner by presenting cup to Dr. Thomas S. Gates, founder of Gates plan.

Below we see the havoc wrought by an explosion at the chemical works of W. J. Bush and Co., Ltd., at Mitcham, England, attributed to a defective bolt in a still used for the distillation of methylated spirit at the works, which permitted inflammable vapor to escape. The bolt—one of six of similar type which had been renewed about a month before—was found to have come apart from the other five after the explosion.



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Amino J Acid
Amino Phenol Sulphonic Acid (1:2:5)
Aniline Oil
Anthraquinone
Anthrarufin

Benzanthrone
Benzidine Base Distilled
Benzoyl Benzoic Acid (Ortho)
Beta Amino Anthraquinone
Beta Naphthol
Beta Naphthylamine
Broenners Acid

Calcium Malate (Normal)
Cassella Acid
Chicago Acid (SS Acid)
Chlor Benzanthrone
Chlor Quinizarine
Chromotropic Acid
Cleves Acid (1:6–1:7 & Mixed)
Cumidine

Dianisidine
Diethyl Aniline
Dimethyl Aniline
Dinitrobenzene
Dinitrochlorobenzene
Dinitrotoluene (M. P. 66° — 55° — 20°)
Dinitrotoluene Oily
Dinitrophenol
Dinitrostilbene Disulphonic Acid
Di-Ortho-Tolyl Thiourea
Diphenyl Methane
Ditolyl Methane

Epsilon Acid
Ethyl Benzyl Aniline
Ethyl Benzyl Aniline Sulphonic Acid

Fumaric Acid

G-Salt
Gamma Acid

H-Acid
Hydroquinone

Isatin

J-Acid

Koch Acid

L-Acid
Laurents Acid

Malic Acid
Maleic (Toxilic) Acid
Maleic (Toxilic) Anhydride
Metanilic Acid
Meta Nitro Para Toluidine
Meta Phenylene Diamine & Sulpho Acid
Meta Toluylene Diamine & Sulpho Acid
Mixed Toluidine
Myrbane Oil

Neville-Winthers Acid
Nitro Amino Phenol (4:2:1)
Nitro Benzene
Nitroso Phenol (Para)

Ortho Anisidine
Ortho Chlor Benzaldehyde
Ortho Chlor Benzoic Acid
Ortho Chlor Toluene
Ortho Nitro Anisole
Ortho Nitro Toluene
Ortho Toluidine

Para Amino Phenol
Para Amino Acetanilide
Para Nitroaniline
Para Nitrotoluene
Para Nitroso Dimethylaniline
Para Toluidine
Peri Acid
Phenyl J. Acid
Phenyl Peri Acid
Phthalic Anhydride

Quinizarine

R-Salt

S-Acid
SS-Acid (Chicago Acid)
Schaeffer Salt
Schoellkopf Acid
Sodium Hydrosulfite
Sodium Metanilate
Sodium Naphthionate
Sodium Sulphanilate
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INTERMEDIATES

Solvents

Diluents — Thinners

New developments in chemicals from petroleum review by C. I. Kelly, Asst. Chief Chemist, Anglo-American Oil Co., Ltd.

THE literature of recent years has devoted much space to the comparison of white spirit and turpentine as thinners, the primary aim being the adulation of the latter. In spite of this, the paint industry continues to consume increasing quantities of white spirit, for its superiority over turpentine lies in (1) its uniform quality, (2) its stable white appearance, (3) the absence of any tendency to "go-off" in storage, (4) its ready availability, and (5) its low price.

Objection has been made against petroleum naphthas as diluents on account of their solvent powers being less than corresponding coal-tar fractions, and because their evaporation rates used to decrease rapidly with time. The latter deficiency has been successfully eradicated by decreasing the distillation range and by using more efficient fractionation equipment. This development has assisted in increasing their solvent properties in as much as the hydrocarbons in them boil more closely to the boiling points of the aromatic hydrocarbons found in these fractions. The usefulness of such products could be increased still more, by narrowing down the boiling range about the boiling points of the aromatic hydrocarbons or their constant boiling point mixtures with the other hydrocarbons present, as done during the war when aromatic hydrocarbons were needed for explosives manufacture. This procedure is, however, not a practical solution, for it would mean curtailment of supplies and increased prices. The most satisfactory solutions lie in (1) the synthetic production of aromatic hydrocarbons from petroleum, and (2) the manufacture of high solvency naphthas by the hydrogenation of petroleum.

Almost any petroleum fraction when cracked at suitable temperatures will yield aromatic hydrocarbons, ranging from benzene to the polynuclear hydrocarbons (naphthalene, etc.). The most suitable starting material from most points of view, however, is natural gas and refinery gases, which are being produced in ever increasing quantities; they are cheap and new outlets for them are sought. The extensive research work with the simpler hydrocarbons has demonstrated that methane is the most refractory, which is unfortunate because it forms the largest part of natural gas. Refinery gases, therefore, seem to be more suitable since they contain larger amounts of ethane, butane and propane all of which are much more amenable to treatment than methane. When these gases are violently treated at temperatures between 700 and 1,100° C., they undergo cracking reactions yielding olefines which polymerize into benzene and its homologues, some higher aliphatic hydrocarbons being produced as well. Yields of approximately two gallons of benzene per thousand cu. ft. of gas have been claimed. The main factors in the process are temperature, pressure, and time of contact with the heated zone, the tendency being to work at atmospheric pressure and to select the best temperature/time of contact ratio for the gases used. This method of manufacturing aromatic hydrocarbons for general use does not appear to have been established commercially, but it is understood that full scale plants are being operated in Persia and that a semi-scale plant has been built in America.

Hydrogen is made by a continuous process from natural gas or refinery gases which are mixed with steam and passed through catalysts in tubes heated to about 1,600° F. The carbon monoxide and hydrogen formed are mixed with more steam and contacted with a second catalyst at about 850° F. The carbon dioxide so produced (approx. 20 per cent. of the mixture) is removed by triethanolamine in a scrubbing tower operating under a pressure of 250 lb. per sq. in. The gas leaving the scrubber (97 per cent. hydrogen) is compressed to 3,000 lb. per sq. in. and mixed at that pressure with selected low-aniline-point gas oil. Having been raised to 700° to 850° F., the reactants are passed into chambers filled with sulfur-resistant catalysts. There, the exothermic reaction raises the temperature to 750 to 1,000° F. or more if desired. After cooling, the liquid reaction products are separated from the gas under the full pressure of the system and subsequent fractionation of the liquid yields the hydrogenated solvent naphthas.

The following table enables one to compare the solvent powers of a hydrogenated solvent naphtha, a petroleum product (normal) and a coal-tar fraction, all being of approximately the same boiling range:—

	Hydrogenated Solvent Naphtha	*Normal Petroleum Naphtha*	*Coal Tar Naphtha*
Sp. gr. at 60° F.	0.8676	0.7715	0.859
Aniline Point, °C.	—28.3	64	8.3
Initial Boiling Point, °C.	145	155	150
Final Boiling Point, °C.	211	212	192
Kauri Butanol Value*	77	30	72

*Denotes the amount of the solvent naphtha which can be added to a standard kauri gum solution without coagulation.

Four hydrogenated naphthas having graded evaporation rates favoring their use in different types of coating compositions can be produced, the respective boiling ranges being 200-275°, 275-365°, 365-419° and 419-550° F. Of these, the more rapidly evaporating grades would be selected for lacquers, whereas varnishes would call for the slower evaporating qualities. Their use in coating compositions would not necessitate any modification in the normal procedure adopted for normal petroleum fractions, etc. The advantages they offer, reside in their ability to dissolve appreciably more of the common gums and resins and in the far greater quantities that are permissible when they are used as diluents. This is a natural reflection of their high kauri-butanol values.

British Chemical Profits

By S. Howard Withey, F. C. I.

Chemical manufacturers and tar distillers have reported satisfactory results, and during the financial year to June 30, 1932, the trading profit realized by Burt, Boulton and Haywood, Ltd., amounted to £98,488, which figure was arrived at after adding income from investments and deducting administration expenses. The balance of net profit was £45,800, after providing £20,878 for depreciation, which compares with a net profit of £51,934 realized during the preceding twelve months, enabling the ordinary dividend to be maintained at the rate of 8 per cent. at the expense of the carry forward. In addition to chemical manufacturing and tar distilling, this company—which was registered in 1898—engages in the business of timber merchants and sawmill proprietors, and controls the Soc. Chimique de Selzaete, in which the Imperial Continental Gas Association also holds a considerable interest, the authorized share capital being £720,000, of which a total of £669,790 ranks for dividend, comprising £150,000 in 7 per cent. cumulative preference £1 shares—the dividend on which absorbs £10,500—and £519,790 in ordinary £1 shares. There is also an issue of 6 per cent. first mortgage debenture stock, recently quoted at 101½. Manufacturers of chemicals used in textiles and agriculture have encountered many obstacles, and after allowing £4,014 for depreciation, a loss of £5,989 was sustained by Eastern Chemical Co., Ltd., during the year ended March 31, 1932, thereby increasing the debit balance to £39,488.

Profits realized by firms specializing in fertilizers have been fairly satisfactory, and the final account of Lawes' Chemical Manure Co., Ltd., covering the financial year ended June 30 last, disclosed a net profit of £3,316, which figure compares with £1,515 realized during the preceding twelve months. After adding the sum of £919 brought forward from the previous account, there was a disposable balance of £4,235, and this enabled a dividend of 7 per cent. to be paid on the £38,375 of non-cumulative participating preference shares. The company, which was registered in 1872, absorbed the London Manure Co. in 1892, and holds a controlling interest in the Jersey Trading Co., Ltd., and in W. S. Ferguson and Co., Ltd., the authorized share capital being £400,000, of which a total of £164,340 has been issued and paid up, *viz.*, £38,375 preference, and £125,965 ordinary. The preference dividend accounted for £2,686, leaving a credit balance of £1,549 to go forward to the next account. In the case of Langdale's Chemical Manure Co., Ltd.—which was registered in 1871—the profit for the twelve months ended September 30, 1932, worked out at £990, or a decline of £169 in relation to the figure for the previous year, the debit balance on profit and loss account being consequently reduced from £1,278 to £288. In 1903 the authorized share capital of this company was reduced from £175,000 to £109,000, all of which has been issued and paid up in the form of £5 shares of one class.—Abstracted from *Chemical Age* (London).

I. C. I. Progress in 1932

Addressing the shareholders at the sixth annual general meeting of Imperial Chemical Industries, Ltd., in London, Sir Harry McGowan, K.B.E. (chairman), said: "The storm of the economic depression continues to rage throughout the world, and we may be thankful that in these islands we have been, as it were, within the shelter of a protected harbor. Great Britain has achieved a measure of stability in the volume of her internal trade, and has also comparatively improved her position in international markets. The general recovery in the volume of business in each of our eight manufacturing groups is to be attributed in the main to an expansion of the volume of home business. The company has continued its policy of fully maintaining all plants in a condition of the highest efficiency as a normal charge against revenue. Further concentrations of manufacture have taken place, notably in the alkali and leather cloth groups. Similar steps are in progress in the metal group. New capital expenditure during the year upon manufacturing plants has been restricted to those cases where careful estimates have justified our embarking upon the venture.

"Our cash resources have largely increased. At December 31, 1932, the amount of cash in hand and invested in Government securities amounted to £7,076,269, or an increase of £2,853,369 over the preceding year, notwithstanding our having financed a bigger volume of trade.

"The arrangements in regard to dyestuffs have functioned very satisfactorily. Chaotic conditions of competition in the world nitrogen industry continued during the first half of 1932. Following many international conferences, however, an agreement between the principal producers has been made for the fertilizer year ending June 30, 1933. In these discussions and arrangements the Chilean producers participated. Economic and financial conditions in Chile, as a result of the world depression, are extremely difficult, but I trust that a policy of mutual understanding and sympathy between the producers of synthetic and natural fertilizers will lead to a continuation of the present world arrangement.

"Our annual expenditure in this country on technical research exceeds £500,000. This is all charged against revenue. We have continued our research work on hydrogenation with marked success. There is no foundation for the general suggestion that the direct hydrogenation of coal is unsound economically by comparison with carbonization of the raw coal first, followed by the hydrogenation of the resulting tar. Our technical staff is still working on the direct hydrogenation of coal. It does not preclude the use of tars as they become available in suitable quantity and at suitable prices. In fact, we foresee a definite field for tar hydrogenation as well, which should be of great assistance to the carbonization industries. Large scale commercial development of our hydrogenation process now only waits upon progress in regard to a limited number of economic factors. When that is achieved, we shall be prepared to invest a substantial sum out of our present liquid resources upon this enterprise."—*Chemical Trade Journal.*

The Economics of Carbon Black

By Walter J. Murphy

INCREASE in sales and decrease in production featured carbon black in 1932. According to recent statistics of the Bureau of Mines 1932 output totalled 242,700,000 pounds, a decline of 38,207,000 pounds, or 14 per cent. from 1931. For the second successive year production decreased.

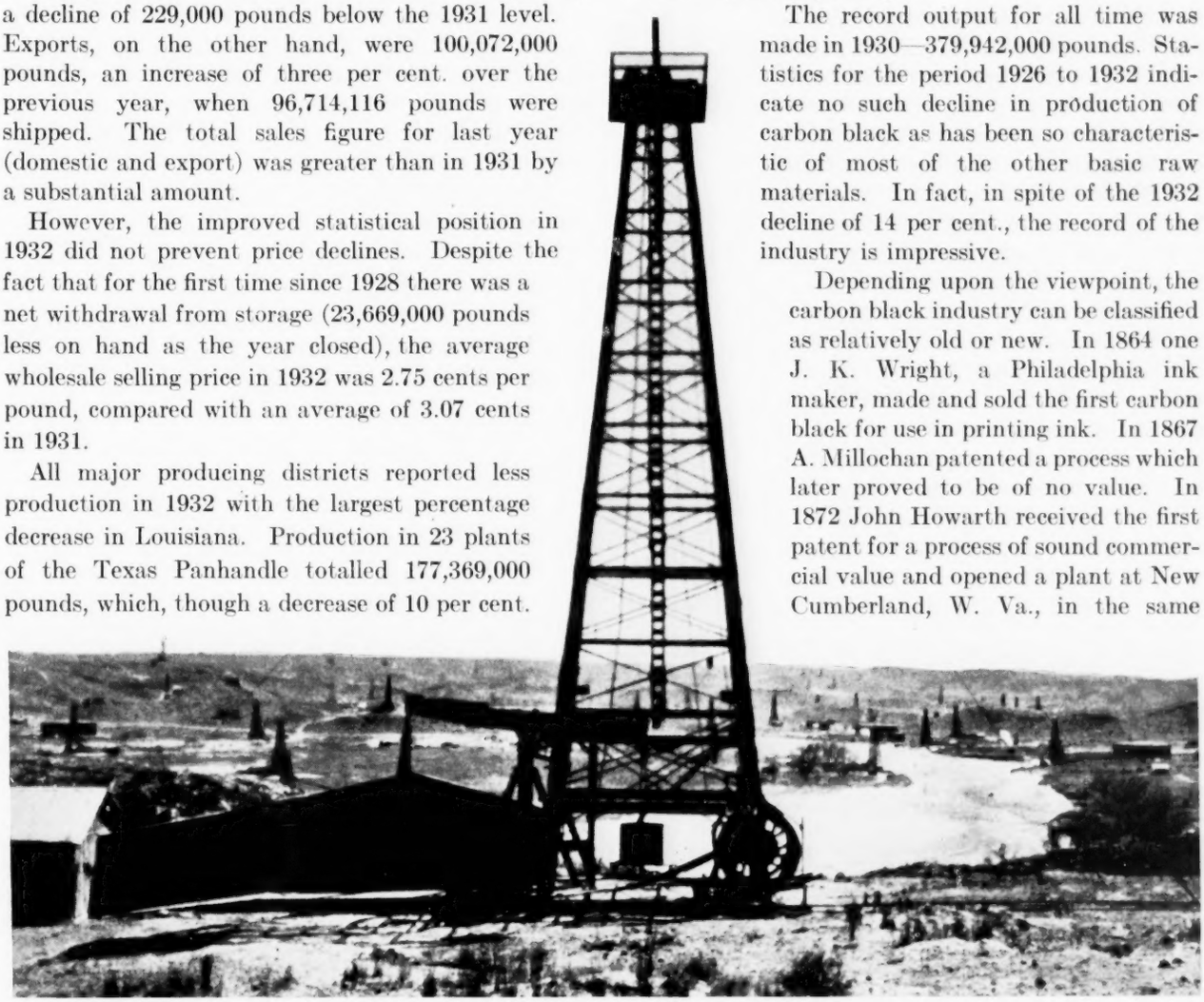
Domestic sales in 1932 were 161,483,000 pounds, a decline of 229,000 pounds below the 1931 level. Exports, on the other hand, were 100,072,000 pounds, an increase of three per cent. over the previous year, when 96,714,116 pounds were shipped. The total sales figure for last year (domestic and export) was greater than in 1931 by a substantial amount.

However, the improved statistical position in 1932 did not prevent price declines. Despite the fact that for the first time since 1928 there was a net withdrawal from storage (23,669,000 pounds less on hand as the year closed), the average wholesale selling price in 1932 was 2.75 cents per pound, compared with an average of 3.07 cents in 1931.

All major producing districts reported less production in 1932 with the largest percentage decrease in Louisiana. Production in 23 plants of the Texas Panhandle totalled 177,369,000 pounds, which, though a decrease of 10 per cent. from 1931, was equivalent to 73 per cent. of the country's total output. In 1930 and 1931 this ratio was 67 and 70, respectively, indicating a continued centralization of the industry in the Texas Panhandle. Utah and Montana dropped entirely out of the producing column in 1932, leaving only Texas, Louisiana, Oklahoma, and Wyoming.

The record output for all time was made in 1930—379,942,000 pounds. Statistics for the period 1926 to 1932 indicate no such decline in production of carbon black as has been so characteristic of most of the other basic raw materials. In fact, in spite of the 1932 decline of 14 per cent., the record of the industry is impressive.

Depending upon the viewpoint, the carbon black industry can be classified as relatively old or new. In 1864 one J. K. Wright, a Philadelphia ink maker, made and sold the first carbon black for use in printing ink. In 1867 A. Millochan patented a process which later proved to be of no value. In 1872 John Howarth received the first patent for a process of sound commercial value and opened a plant at New Cumberland, W. Va., in the same



Rubber tires, printing ink, phonograph records and black paints have one thing in common—their color. Carbon black has become one of our most necessary raw chemicals, not only imparting color to these and other important items of everyday use, but special valuable physical and chemical properties as well. A natural gas field in the Panhandle Section of Texas where the largest part of our carbon black supplies now are produced.

year. The improved process permitted a reduction in price from about $5.00 a pound to $1.25. This plant was soon destroyed by fire and operations were transferred to Cabot, Pa., then known as Saxonburg Station.

In a few years additional competition came into the field, and by 1879 the price declined to 60 cents. A. J. Nolen was at this time very prominent in the industry, and in 1882 Samuel Cabot of Boston erected a plant at Worthington, Pa. In the following year L. Martin & Co., of Philadelphia, (now part of Columbian Carbon) came into the industry. The price declined rapidly as capacities increased. By 1887 it reached seven cents and two years later four cents a pound. A temporary rise to seven cents was finally followed in 1892 by a long period of fairly stable prices around a six cent level.

For years after Wright's discovery the principal use of carbon black was in printing ink manufacture, and growth was slow, but certain. In 1887 production was about 1,000,000 pounds annually; by 1900 it had increased to 6-7,000,000 pounds; by 1915 to 20,000,000 pounds. Then came the war, and zinc oxide, an important rubber filler, became scarce and expensive. Casting around desperately for a substitute carbon black was found to work admirably. It was soon apparent that carbon black was more than a substitute; that it did a much better job as a filler than any of the materials previously employed. By 1927 Reid L. Carr, secretary of Columbian Carbon Company, was able to write (Carbon Black a Vital Business Need, *Oil and Gas Journal*, June 16, 1927):

"The most remarkable chapter in the story of carbon black has been its world-wide adoption by the rubber trade during the past decade. Those of us who owned automobiles in the early days vividly recall how frequently our pleasure was spoiled by a puncture or blowout. Such incidents were of almost daily occurrence, usually at the most vexatious time and place. Finally, the rubber chemists, after a long search for something that would make tires tougher and more serviceable, hit upon carbon black. Its success was immediate and spectacular. Beginning with one or two of the larger American manufacturers, the use of carbon black in tire tread stocks rapidly spread throughout the entire rubber industry, both in this country and abroad. At least 100,000,000 pounds per year are now consumed by the rubber trade. Virtually all tire treads are black. A tire with a white tread is as rare as the proverbial "white blackbird."

"Everybody knows that tires give two or three times as much service as they once did, but few of us have ever troubled ourselves to ask why. Still fewer realize that a natural gas product has anything to do with it. The popular impression probably is that the use of any substance other than rubber in a tire is only to color or cheapen it. But nothing could be further from the truth. Carbon black is universally employed in tire-treads, not because of its cost or color, but because it adds to the tensile strength and resiliency, toughens the rubber, increases its resistance to abrasion, minimizes punctures and blowouts, and so insures greater mileage."

Over night the carbon black industry was reborn. In seven years (1919 to 1925) production more than tripled; from 52,056,000 to 177,417,378 pounds. Once entrenched in the rubber industry carbon black consumption has shown a steady record of growth. In 1932 sales were divided as follows: rubber, 130,380,000 pounds; ink, 18,341,000 pounds; paint, 7,636,000 pounds; miscellaneous, 5,126,000 pounds.

Because of its low cost the dollar value of carbon black is not as impressive as many items that really do not have so important a role to perform in modern civilization. Total value has run as high as $18,000,000. In 1932 this declined to $6,664,000. Small quantities of carbon black go a long way. For example: one pound mixed with ten gallons of oil produces enough news ink to print over 2,000 copies of an ordinary 16 page newspaper. Thomas D. Cabot in an article "The Development of Carbon Black" which appeared in the *American Ink Maker* (Sept. 1927) also pointed out that one pound added to the tread-stock of a 3½ inch automobile tire will increase its mileage from less than 5,000 to 15,000 miles.

As the carbon black industry expanded it followed the natural gas development, spreading south and west. At first centered in Pennsylvania, between 1900 and 1915 it migrated to West Virginia. Within a comparatively short time an enormous new gas field was discovered near Monroe, La., and the industry was again on the march. As late as 1926-1927 more than three-fourths of the entire world's output of carbon black was produced in this area. Since 1928, however, the Monroe fields have given away in importance to Texas, particularly the Panhandle section. The sudden shift from Louisiana to Texas is clearly shown by the following:

	Per Cent. of Total Production				
	1928	*1929*	*1930*	*1931*	*1932*
Louisiana.....	54.8	34.8	24.5	21.3	17.4
Texas.....	40.5	62.3	71.5	78.7	82.6

What causes have been responsible for these drastic migrations? First, it must be clearly recognized that the carbon black industry is an industry within an

Panorama view of the largest carbon black plant in

industry and the economics surrounding carbon black are largely dictated by the current situation in the natural gas field. The great decline in production in the Monroe area has been caused by the competition for gas by long natural gas pipe-lines running into such large urban centers as St. Louis, Atlanta, Birmingham, Little Rock, Memphis, Baton Rouge, New Orleans. The same compelling reason that caused the shift from Louisiana to Texas was responsible earlier for the migrations from Pennsylvania to West Virginia and then to Louisiana. Another important reason for the switch from Monroe to Texas was the narrow attitude on taxation exhibited by the state authorities of Louisiana. Such situations are not unknown to chemical industry. The sulfur companies have been continually harassed by such legislation, and only within the past few months attempts were made to place a production tax on our infant domestic potash industry in New Mexico.

Already the maximum capacity of the pipe-lines coming out of the Panhandle section is in excess of 420,000,000 cubic feet per day, As the demand for gas for industrial purposes (other than carbon black production) increases, the cost of the raw material for its production under normal conditions goes higher. The carbon black industry can only thrive where abundant supply of natural gas is available at a very low price. It is thought, however, that the enormous supplies of natural gas in the Panhandle Section will tend to prevent any immediate concern as to the future of the carbon black industry. Greater extension of long distance pipe-lines may cut into the supplies of gas available to carbon black producers, but the effect will in all probability be but a very, very slow increase in the exceptionally low price level. This phase of a complicated situation might be called the "long-term possibilities." It has been reported that over 400,000,000 cubic feet of gas per day is discharged into the air, in the Texas section alone, an amount more than equal to the requirements of the entire carbon black industry. It would hardly seem possible that failure of sufficient raw material for carbon black manufacture is even remotely possible for sometime to come.

The economics of the industry are greatly affected by the complicated situation in the oil and gasoline field. The large volume of casing-head gas which has become available in Texas within the past five years has changed the picture. This tremendous production had no outlet but in the manufacture of carbon black. The result has been that plants erected in this section have been able to buy casing-head gas at extremely low figures, escaping the expense and risk of sinking wells. Thus much of the initial expense of normal operation is eliminated entirely. Possibly the inducement of this cheap gas has been largely responsible for capacities far in excess of actual requirements.

The industry has been further bedevilled by the possibility of governmental restriction of the oil industry. In 1931 a flurry of excitement occurred when Governors Murray and Sterling of Oklahoma and Texas, respectively, called out the militia to enforce state-decreed conservation. Only a few weeks ago the President was reported as being in sympathy, in a broad sense at least, with some official pressure to bring about curtailed production of petroleum. Any such activity would have obvious effect on the carbon black industry.

The export situation is encouraging. Carbon black enjoys an even more advantageous position than other outstanding raw chemical commodities such as sulfur, naval stores, and phosphate rock. Although our position is commanding in the last three, we do not enjoy an absolute monopoly. In carbon black we do. The United States is the world's only source. Several countries have surplus quantities of natural gas but do not manufacture the black. A few, like Germany, have spent large sums in an endeavor to prepare a black pigment to compete with carbon black, but to date results have been disappointing. Periodically reports reach this country of a practical synthetic process, but apparently none has yet any commercial value.

Carbon black is one of our leading chemical export items. In 1931 it was sixth on the list and the volume reached 96,714,000 pounds; a gain of 14.8 per cent. In 1932 a further gain of three per cent was registered. In the past two years—the worst international economic crisis in modern times—when export trade has dwindled month by month, our carbon black export trade has shown remarkable growth. Statistics of exports for the years 1929 to 1931 inclusive follow. Figures for 1932 are given in the general data table:

United States exports of carbon black

	1929		*1930*		*1931*	
Country	*Pounds*	*Value*	*Pounds*	*Value*	*Pounds*	*Value*
Australia	5,705,833	$510,526	2,630,771	$184,283	1,915,738	$ 97,890
Belgium	2,260,152	196,946	2,644,502	174,676	2,896,126	139,952
Canada	13,890,749	975,002	11,757,174	601,134	9,825,346	352,236
China	1,049,680	97,417	995,423	70,614	1,047,870	58,320
France	16,698,430	1,708,131	16,438,685	1,179,074	18,039,671	1,005,411
Germany	14,049,753	1,363,124	12,369,542	902,712	14,414,348	771,243
Italy	2,544,267	239,907	2,485,113	210,034	2,808,707	165,458
Japan	5,113,956	469,511	4,402,010	299,254	6,313,937	327,366
Netherlands	2,006,238	188,991	1,896,430	138,249	1,583,015	86,051
United King.	23,273,769	2,068,911	24,017,974	1,695,203	32,279,788	1,763,180
Other	5,236,388	452,371	4,622,823	334,225	5,589,570	311,731
Total	91,829,215	8,270,837	84,260,447	5,789,458	96,714,116	5,078,838

the world located in the Panhandle Section of Texas.

Operations in the carbon black field have not lately been profitable. Earning statements of leading companies available invariably show sharp declines. United Carbon, for example, showed a net profit of $145,643 for the year ending Decem-

BASIC STATISTICS OF CARBON BLACK INDUSTRY — YEARS 1920, 1928, 1929, 1930, 1931, 1932

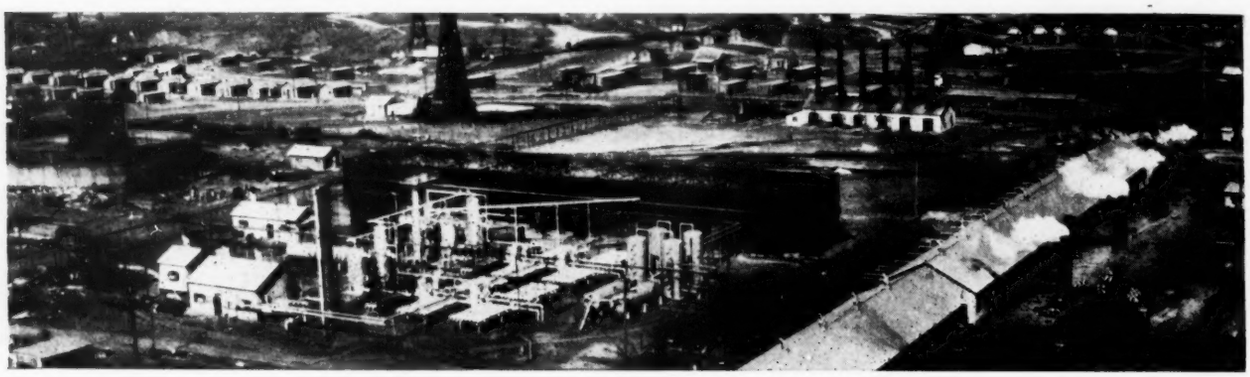
	1920	*1928*	*1929*	*1930*	*1931*	*1932*
Number of Producers reporting	19	31	35	33	26	24
Number of Plants	35	65	71	68	58	50
Quantity Produced, Louisiana	18,565,498 lbs.	136,320,000	127,345,000	96,729,000	57,485,000	42,260,000
Texas		100,828,000	228,183,000	254,844,000	197,546,000	177,369,000
Panhandle						
Breckenridge District				16,905,000	13,332,000	*23,071,000
West Virginia	26,659,469	697,000	578,000	†	†	†
Kentucky	6,096,925	484,000		†	†	†
Other States		10,461,000	10,336,000	11,464,000	12,544,000	*
Total	51,321,892	248,790,000	366,442,000	379,942,000	280,907,000	242,700,000
Produced by						
Channel process	not reported	220,532,000	327,552,000	350,254,000	255,322,000	224,536,000
Other processes‡	not reported	28,258,000	38,890,000	29,688,000	25,585,000	18,164,000
Stocks held by producers						
December 31, pounds	not reported	50,240,000	132,203,000	259,245,000	281,667,000	257,998,000
Losses, pounds	not reported	802,000	673,000	1,361,000	1,716,000	4,814,000
Sales, pounds:						
To rubber companies	not reported	140,938,000	138,474,000	128,572,000	134,315,000	130,380,000
To ink companies	"	27,223,000	27,350,000	19,220,000	15,184,000	18,341,000
To paint companies	"	20,040,000	17,257,000	11,922,000	6,760,000	7,636,000
To miscellaneous companies	"	14,475,000	8,896,000	7,565,000	5,453,000	5,126,000
Total	not reported	202,676,000	191,977,000	167,279,000	161,712,000	161,483,000
Export	not reported	77,903,000	91,829,000	84,260,000	96,714,000	100,072,000
						United Kingdom 31,059,000
						France 19,460,000
						Germany 16,216,000
						Other 33,337,000
Value (at plants) of carbon black produced. Total (dols.)	4,032,286	13,782,000	18,720,000	14,852,000	8,621,000	6,664,000
Average per pound (cents)	7.9	5.54	5.11	3.91	3.07	2.75
Estimated quantity of natural gas used M cubic feet	40,599,000	175,137,000	264,107,000	266,471,000	195,396,000	168,237,000
Average yield per M cubic feet (pounds)	1.3	1.42	1.39	1.43	1.44	1.44

*Oklahoma and Wyoming included with Breckenridge district.
†Included in other states if any production occurred.
‡Including chain, disk, plate ring, roller, "special," and thermatomic.
Statistics compiled from data sheets issued by the U. S. Bureau of Mines.

ber 31, 1932, after taxes, depreciation, depletion, etc., and after provision of $182,380 to reduce carbon black inventories to market value, equivalent, after allowing for dividend requirements on 7% participating non-accumulative preferred stock, to five cents a share on 370,127 no-par shares of common stock. This compares with a net loss in 1931, of $397,769 after depreciation, depletion, etc., and after provision of $296,962 to reduce carbon black inventories to cost or market. In 1929 there was a surplus of $835,584 after $282,435 was paid in preferred dividends and $196,536 in dividends on the common. Columbian Carbon has shown a net profit in the past four years after depreciation, depletion, federal taxes, minority interest, etc., but not before dividends as follows: 1929, $3,665,491; 1930, $2,514,923; 1931, $1,628,794; 1932, $954,016. After dividend payments there was a surplus of $1,378,771 in 1929 and deficits of $421,243 in 1930; $985,700 in 1931; $384,831 in 1932. These reports, of course, give only a partial picture. Both of these companies have extensive natural gas properties and sell large quantities of gas. It is quite safe to assume that carbon black production has been unprofitable at present prices.

Like the closely related oil industry over-production has been the besetting sin of the carbon black industry. Productive capacities have been built greatly in excess of present needs, and perhaps even of normal requirements, if 1928 and 1929 can be considered normal. On the other hand, producing companies will not continue indefinitely to lose money without making a firm effort to strengthen the price structure. Quite aside from this the possibility—almost probability—of inflation would forecast higher prices when present contracts expire. Further, another year of excess of sales against production will place the producers in a much better statistical position. From present indications this is likely to take place.

The immediate sales future, likewise, is bright. Within the past ten days production schedules in the tire factories of Akron have been speeded up. One, General Rubber, has gone on a 24 hour production basis. Tire prices have advanced generally for the first time in six years. Automobile production schedules have increased. The immediate outlook is favorable to maintenance and expansion of these schedules. If the administration's plans for revival of export business are successful it is likely that the automobile industry will be the greatest benefactor of any such improvement. All this will lead to greater consumption of carbon black.



The economics surrounding carbon black are largely dictated by the current situation in the natural gas field. Above, a natural gas field in Louisiana, carbon black plant, and plant for production of liquefied petroleum gases.

Sulfonated Oils

Andrew J. Kelly Checks The Less Usual Uses

This neat summary of odd uses of these versatile chemical products by a technical sales expert of the Burkart-Schier Chemical Co., was presented at a recent southern meeting of the Association of Textile Colorists and Chemists.

WITH sulfonated castor oil, and to a lesser extent with other sulfonated oils, practically every type of water-insoluble solvent or lubricant can be solubilized or emulsified. This fact is of great importance in the wet finishing of all varieties of textiles, for it makes available a large number of valuable assistants for the conditioning of yarn for weaving and knitting and for the processes of scouring, dyeing, bleaching and finishing. And they are perfectly harmless to hide, hair and hoof. Not all the uses for these versatile oils can be listed here for it is likely that many users have developed particular applications for their own needs, applications which are not generally known.

Water miscible wetting agents and solvents can be prepared with sulfonated oils in a manner hardly to be matched by any other single agent. Some of the penetrants commonly used today can be made by a simple mix of sulfonated castor oil and solvent. Many of the soluble pine compounds can be so prepared, and perhaps some of you prepare your own penetrant in this manner.

However, a vast variety of uses of the sulfonated oils are not generally known—not all of them important but all interesting. It would be impossible to make this list complete, for I think that it can be truthfully said that no one person knows all of the applications to which sulfonated oils are put.

For the pasting of vat dyes, a neutral sulfonated castor oil is ideally adapted. The dyestuff is well mixed with the oil, and caustic and hydrosulfite is then added. This gives the reduced dye, or leuco base, which then is in the proper state for application.

Turkey Red Oil is used in making up dye solutions for the spot dyeing or hand painting of satin slippers. The idea is of course applicable to any form or spot or daub dyeing and in fact there are other similar applications, both tentative and actual.

The softening properties of sulfonated oils are made use of in a great many ways. The oils have of course been used for years in softening all ordinary textiles, generally being applied in small portions in the last rinse. Sulfonated olive oil, sulfonated oleic acid, and sulfonated tallow find a heavy use as softening and finishing agents. They, as well as Turkey Red Oil, are often incorporated in various sizing, softening and fulling compounds. In connection with the softening effect of the soluble oils we also think of the finish which they impart—adding a soft lustre and a pleasant handle to the goods. To this we have already briefly referred.

In the manufacture of dental floss sulfonated castor or sulfonated olive oil is used to remove any scroop which the yarn may have, and to take out any possible harshness. Afterward, the floss is rinsed to remove any taste of the oil which might remain.

In obtaining moire effects on fabrics Turkey Red Oil is applicable and often used. In fact, it is an excellent aid in obtaining any novelty or specialty finish or feel.

Rather paradoxically, perhaps, (and yet illustrating again the versatility of the product) sulfonated castor oil is used in one type or method of delustering hose. Finely divided barium sulfate is pasted with the oil, and this paste is added to the bath. The fine powder is held in suspension and performs its function of delustering. Turkey Red Oil should be used with almost any type of delusterant, especially if there is a noticeable tendency toward streaking in the material. The oil helps to hold the dye level. Many dyers use sulfonated castor oil in their stripping baths to keep the goods in good condition and avoid the appearance and feel sometimes familiar to redyers.

Although it is not commonly known, excellent agents for the scouring of dyeing and finishing machines can be prepared, often by the dyer himself, with sulfonated oils. Any one or more of the grease dissolving chlorinated solvents, such as ethylene dichloride or dichlorethyl ether, is compounded with the oil by vigorous agitation and the mix is applied

either directly or in hot water. The type and amount of solvent, and the method of application, must be varied to suit the conditions of use. If desirable, a little soda ash or other alkali may be used, in conjunction. In passing, it might be mentioned that sulfonated castor oil will clean paint brushes handily—and mixed with kerosene will remove grease and dirt from the hands. There is absolutely no harmful action on the skin.

In connection with the last sentence is the fact that the cosmetics industry is now consuming a considerable quantity of turkey red and other sulfonated oils. Many shampoos, as well as permanent wave preparations, are based on sulfonated castor oil. Brushless shaving creams also contain this versatile product. And there is one very attractively packaged compound which is to be added to the bath and is advertised to bring a breath of the pine woods to the bath room. Neutral Turkey Red Oil and a little of some aromatic pine derivative such as terpineol does the trick. Sulfonated castor oil is used to solubilize perfumes for the manufacture of theatre sprays, as well as other deodorants or antiodorants. In fact, water soluble perfumes for every sort of use are prepared by blending the essential oils with the sulfonated oils. A new wrinkle is that sulfonated castor oil is now put up in one gallon cans and sold by retail drug stores to the beauty parlor trade. Thus you see that Turkey Red Oil is used to beautify humans as well as textiles. These uses were generally discovered or developed by the cosmetics manufacturers themselves, who needed a versatile and harmless emulsifying agent. I do not believe that their industry has ever been closely worked by any of the oil producers.

In the manufacture of pine oil, coal tar and creosote type disinfectants there are several types of emulsifiers used. Rosin soap is often recommended for the sake of economy. But disinfectants made with sulfonated oil as emulsifier usually show a higher coefficient (which is the measure of their effectiveness), for equal amounts of disinfecting agent, than do those made with soap and other emulsifiers. This is so because the sulfonated oil emulsions are more uniform, more stable, and give a much finer dispersion—this last factor is essential in a good self-emulsifying disinfectant. There is a considerable field open for the development of better insecticide and germicide agents through the use of sulfonated oils.

Sulfonated oils are used in preparing asbestos products. They are quite largely consumed in the processing of leather, and for this application sulfonated cod oil is often desired. Sizing preparations for paper and for book binding materials sometimes contain sulfonated castor oil. It is also used on wood in a few particular lines. Cutting oils for the metal workers can be and are made with sulfonated oil. And certain water soluble tints and stains are improved with soluble oils. And so on.

The Industry's Bookshelf

Profit Engineering, by C. E. Knoeppel, 326 p., published by McGraw-Hill Book Co., 330 W. 42nd st., N. Y. City. $3.00.

A particularly timely book, which comes to us after three or four years of profitless operation, outlining a plan of business organization and methods of conduct such as to secure a profit as far as is humanly possible under good management. The Knoeppel "Profitgraph," about which there has been a great deal of discussion, occupies a very prominent part in the scheme of the book. Mr. Knoeppel's book is well worth the time of harassed executives now sorely pressed on the one hand to meet the insistence of stockholders that a profit be made, and on the other, that employment should be maintained, wages held at comparatively high levels, depreciation charges fairly adhered to, and quality of product held inviolate.

The Handbook of Butane-Propane Gases, First Edition, edited by, George H. Finley, 278 p., published by Western Business Papers, Inc., 124 W. 4th st., Los Angeles, Cal. $5.00.

The handbook is the joint labor of many individuals and reflects the experiences of numerous organizations and accumulates under one cover much of the basic reference material for which those in and out of the industry have frequent need. The hydrocarbon gas industry is one of the newest and one of the fastest growing. A very definite need existed for a compilation of accurate data. The handbook, assembled under the guidance of the editor of *Western Gas*, fulfills this void.

Physico-Chemical Methods, by J. Reilly and W. N. Rae, 822 p., published by D. Van Nostrand Co., Inc., 250-4th ave., N. Y. City. $8.00.

Book is intended primarily for the advanced student who desires to obtain a general knowledge of the subject of physico-chemical problems, and for the investigator wishing to know the methods which have been applied to solve particular types of problems. This, the second edition, has been greatly enlarged over the first of 10 years ago. Twenty chapters have been added. The book is clearly entitled to being termed a standard work on the subject, and should be in the library of every research worker who is called upon to handle problems of a physico-chemical nature.

The Methods of Cellulose Chemistry, by Charles Dorée, 499 p., published by D. Van Nostrand Co., Inc., 250-4th ave., N. Y. City. $7.00.

Designed and written for the student about to undertake research in the wide field offered by cellulose and the substances associated with it in the plant world, also for workers in laboratories controlling and investigating the manufacture of cellulose products. The author at the expense of great labor has gathered together a wealth of information, as well as the best methods of analysis and control. To those connected with the many diverse uses for cellulose the book will prove a real help.

Our Mineral Civilization, by Thomas T. Read, 165 p., published by The Williams & Wilkins Co., Baltimore, Md. $1.00

Not a statistical compendium, but an entertaining store of man's progress in utilizing minerals to augment his natural capacities. This book is one in the "Century of Progress Series."

Latex and Its Industrial Applications, by Frederick Marchionna, 1037 p., published by The Rubber Age Publishing Co., 250 W. 57th st., N. Y. City. $15.00.

It would be impossible to review even in a page of text the ground covered by this book. It represents years of patient labor in assembling an authoritative survey of the international patents on latex. To those connected with the rubber and latex industry the book is indispensable. In an industry where the patent situation is so highly involved the book takes on a double value. Perhaps Mr. Marchionna's noteworthy contribution suggests the possibility of similar compilations in other branches of the chemical and allied industries, for example, lacquers, plastics, etc.

This analysis of the present status of French chemical industries has been made available through the courtesy of J. M. Erwin, Editor of "Foreign Trade" (Paris).

French Chemical Capacities and Capitalization

CONDITIONS prevailing in the French chemical industry were analyzed recently to the Conseil National Economique by M. Gounod, vice-president of the Union des Industries Chimiques. His report covers the evolution of this branch of French manufacturing activity in the course of a century. Some of the essentials of the report are reproduced herewith.

The importance of the leading chemical industries in France is reflected in the number of factories and employees and the capital invested. For instance: number of enterprises, 1,100; number of workmen and employees, 200,000; capital invested, 12 to 15 billion francs.

The following table gives an idea of the proportions of the more important lines.

	Number of Enterprises	*Number of Employees*
Heavy industries, superphosphates, nitrogen, compressed and liquefied gases, etc.	123	75,000
Pharmaceuticals	256	22,000
Colors, varnish, lithopone, printers ink, pencils	267	14,000
Petroleum	14	12,500
Dyestuffs	9	5,000
Explosives	15	3,700
Films, photo supplies	13	3,500
Tanning extracts	19	3,400
Synthetic products	10	2,300
Abrasives	27	1,700
Distillation of wood	13	1,400
Celluloid	11	700

French chemical industry, because of heavy investment of capital in the increasing mechanization, vertical concentration resulting from the interdependence of the various processes, as well as the rational utilization of by-products, tends logically to concentrate. This explains partly why, in spite of great development in certain branches the number of firms has not increased but, even on the contrary, with regard to some branches, has been restricted since 1913. Moreover, certain establishments have several factories. Seven of them thus control each thirty or more plants.

About 148,000 persons are employed in the branches indicated, but, taking into account various groups not included, it is safe to estimate the total at about 200,000. Two-fifths, or say 75,000 persons, are occupied by what is known as the *grande industrie chimique*. It is estimated that of the 12 to 15 billion francs investment in the French chemical industries at present, that nearly all of this capital is French, thus constituting the independence of the industry. At the time of the monetary crisis in France certain foreign attempts were made to gain a footing in some French chemical industries, and there was considerable discussion of a project of plural share voting. Even though the danger resulting from devaluation was averted, the general sentiment in the trade is in favor of a plan which in urgent cases can protect effectively the branches which are vital to national defence.

French chemical business domain in 1929 amounted to 10 or 11 billion francs, placing this industry in fifth place, after machinery, metallurgy, cotton, and wool industries. The turnover sales tax alone for the chemical industries amounts to about 200 million francs. The *rentabilité*, or profit-producing capacity of industries, is not always in proportion to the efforts made, because of the prudent policy of amortizations and reserves, particularly with regard to enterprises of recent creation or in the process of developments that are menaces because of new and more economical processes. In perhaps a majority of cases, French chemical output is in good proportion to the volume of its domestic market, contrary to some other countries, in which certain industries were more influenced by possibilities offered (particularly prior to the war) by foreign markets. However, while the French chemical industry has attained proportions in accordance with a domestic market the independence of which was the prime consideration, the fact must not be overlooked that it is a great supplier of various important industries, many of which are big exporters. Because of exporting less, agriculture takes less fertilizer, the textile industry takes less dyes or less bleach, the furniture industry less glues, the leather trade less of tanning extracts, the automobile industry less cellulose varnishes, etc. The tendency of the French chemical industry toward an equilibrium of its production potential, measuring its effort with the safe field of action, leads it to adopt "dimensions" which, in comparison with more audacious enterprises, may be criticized as being

too conservative, but in the light of prevailing conditions they should be considered entirely harmonious and prudent. With a production capacity entirely sufficient for all eventually, they permit of an effective production approximately balanced with a sufficiently stable consumption.

The various agreements and accords in the French chemical industry are numerous and not generally disclosed in detail. It is natural that each interested party conceal the methods employed in accord with other members of an entente. Mention may be made, however, of a number of agreements and conventions, such as the following: Convention relating to aniline colors, originally Franco-German, and Franco-German-Swiss since 1929, which England joined at the beginning of 1932. Convention on potash, Franco-German. Convention on nitrogen fertilizers, constituted in 1930 but not renewed in 1931: Germany, England, Norway, France, Italy, Belgium, Holland, Poland and Czechoslovakia. The "Epidos", of 1926, merging the glue manufacturing interests of 16 European countries. Cartels: relating to magnesia and borax. Bismuth syndicate: Germany, Great Britain, France and Italy. Convention relating to iodine: France, Great Britain and Norway. Convention relating to quinine: Holland, Java, Great Britain, Germany, France, Switzerland, United States and Japan.

Chemical Equipment and Apparatus

When a chemical manufacturer requires new equipment two courses are open to him. His own technical staff may design the equipment and send out working drawings and specifications to suitable makers for quotations, or alternatively may send a statement of his requirements to the makers and leave them to design the equipment. There are advantages and disadvantages in both methods. In the first, provided the technical staff are competent, and sufficiently experienced in the design of that particular kind of equipment, they are in a better position to produce a design which exactly fulfills the requirements, because they are familiar with the working conditions, which the equipment maker is not. Added to this they have no reason to make it any larger or more expensive than is necessary, and this the equipment maker sometimes does for reasons discussed later. On the other hand, the design they produce will be a special one which will probably not fit in well with the equipment standards, and may, therefore, cost more in comparison with a standard design. In this case no question of guarantees arises, for the maker has merely to construct the equipment according to the drawings and specifications provided, and he takes no responsibility regarding the performance.

However competent the chemical manufacturer's technical staff may be, they cannot be specialists in all kinds of equipment with lifelong experience in the design of each, and it is therefore the more common case that the design is left to the equipment maker. This has the advantage that standard type of equipment made from existing patterns and with existing tools and jigs can be supplied, and can, if necessary, be backed up by a guarantee of performance. This course, however, leaves the purchaser to a considerable extent in the equipment maker's hands, and in some cases the position may be abused. On the other hand, the equipment maker is often given insufficient or inaccurate information to work on, and then blamed for unsatisfactory results. My own experience has been almost entirely on the side of the equipment purchaser, but I have a very strong sympathy with the side of the equipment maker, and the main object of this article is to draw attention to the handicaps of the latter, in the hope of persuading the purchaser to give him a fairer chance, to his own ultimate advantage.

The equipment maker's first complaint, which is very often fully justified, is that the purchaser does not give him full and accurate information as to the conditions to be met. Sometimes this is due to ignorance or lack of appreciation of the importance of secondary factors, but more commonly to a misguided fear of giving any more information than can possibly be helped about his methods of manufacture, for fear that this information should reach competitors.

Necessity of Confidence and Cooperation

In the relations between makers and purchasers of equipment there is urgent need for more mutual confidence and cooperation. How can the maker do his best for the purchaser if the latter will not tell him the whole story? At a recent meeting of the Institution of Chemical Engineers, the chairman, Mr. J. A. Reavell, cited a case where he was quoting under very strict guarantees for an evaporator to deal with a liquid stated by the prospective purchaser to contain 17 per cent. of solids. On being asked whether the liquid would always contain just 17 per cent., the purchaser replied "Oh, no, it will often contain over 25 per cent., and sometimes less than three per cent."

If the business of buying and selling chemical equipment is to be carried out on an economic basis, really satisfactory to both parties, each must put all their cards on the table unreservedly. The purchaser should, whenever possible, supply the equipment maker with a sample of the material to be treated, or, if the material is liable to vary in composition or character, with several samples representing extreme conditions, at the same time stating what the average composition will be. Better still, he should, in addition, show the equipment maker the material being produced in his works, and where the new equipment is to go. He should further be quite frank as to whether the duties given represent the actual duties required, or contain any margin for contingencies or future expansion, and whether low capital cost or low running costs are the main consideration. The equipment maker, on his side, should supply drawings which are not merely diagrams, but do show what is being offered, and be equally frank as to what the equipment he puts forward will really do, and how much allowance for contingencies is provided for. He should be willing to study and try to meet any special wishes or ideas the purchaser may have regarding the design or arrangement of the equipment, and not be too proud to consider constructive criticism of his design. The attitude of "This is my standard design; take it or leave it," which is sometimes met with, does not make for good business.

Purchasers are very fond of asking for stringent guarantees as to performance, steam or fuel consumption, and so on. They feel that these guarantees are a protection against having an unsuitable or inefficient equipment foisted upon them, but they do not realize how much extra they pay for this supposed protection. When an equipment maker gives a guarantee it is only natural that he is going to cover himself for his own protection by putting in equipment that is amply big enough for the purpose. Not infrequently he offers equipment that is far too large for the specified duty; sometimes three or more times too large. This may be due to the fact that he has not a standard unit which comes nearer to the purchaser's requirements, or he may feel that he has to provide heavily for contingencies because he cannot rely on the accuracy of the information given him by the purchaser. Now, occasionally, the latter may be glad to have equipment possessing an ample margin, if not at the moment then later on when production has to be increased, but as a rule he wants equipment which will do the required duty comfortably, without forcing, but not more, for the chances are that the other sections of his equipment could not keep step with a largely increased production, and further he does not want to spend more money than he can help.—*Abstracted from The Chemical Age.*

Deflating Assets to Inflate Profits

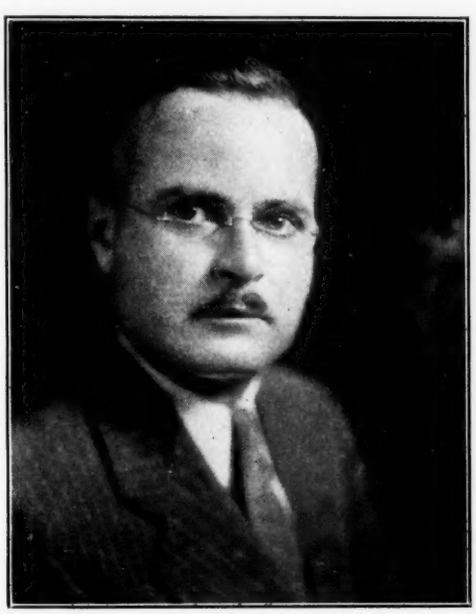
By Wm. R. Donaldson, C. P. A.
of Miller, Donaldson & Co.

ACROSS the financial pages of our daily newspapers the last few months has appeared a succession of corporation annual statements in which reference is made to substantial write-downs of plant and equipment. Printed reports sent to stockholders amplify and explain these write-downs, some mounting to many millions of dollars. It has become the fashion to write down and write off. And like most fashions the idea in which they were conceived soon becomes obscured. We surmise in a few years such corporations will tearfully regret their impetuous action.

What are the reasons for this mode of the hour, what does it accomplish, and what effect has it on present and future financial statements and the operating results of corporations which follow it?

Everywhere directors and financial and accounting executives are discussing what should be done with their plant accounts. They see their competitors indulging in the write-off practice. They realize that in some respects advantages appear which would tend to give their competitors the edge during future years. They feel they should proceed along the road to deflation, and they are right to a certain extent. But when deflating the balance sheet results in inflating future earnings they should think twice before taking the step.

Income or Earnings Statement tells the real story of the success. "What are the earnings per share?" is the popular question rather than "What is the book value per share?" And it is toward increasing income, toward raising up the "earnings per share" that management effort is primarily directed. During the last several years that element of expense existing in every business, which stood out so prominently in the Income Statement, "Depreciation of Plant and Equipment," has worried management. It is a fixed charge that rips away a good chunk of the "income before depreciation" and turns some nice black figures into vivid red ones.



When volume of sales was good, prices high, and plants running fairly active, depreciation represented a minor part of the total income from sales. But now that the wheels have ceased to whir so evenly and sweetly there stands the old rock "depreciation," as big as ever but now a formidable obstacle toward attaining black figures in the Income Statement.

"It's only a bookkeeping item and means nothing. It should be eliminated" says one anxious manager.

"We are running only 20% of capacity and therefore we should have only 20% of the depreciation we had when we were running full," speaks up another quaking treasurer.

"Our plants are all shut down so we have no depreciation expense," adds a worried president.

And then bright Bill Jones pipes up: "If we have no values on our books for our plant and equipment, we will have no depreciation because zero dollars multiplied by 5% equals zero. Nobody pays any attention anyhow to what we carry our plants at on our Balance Sheet. We have plenty of cash, owe nothing much, and are in splendid net current asset position with ample working capital. Our stock is without par value so we can shrink up the stated value, make a capital surplus and, bang, charge off the whole works. Our stockholders will compliment us on how conservative we are, carrying all our vast facilities at $1.00, and from now on, hurrah, no more depreciation. We are bound to show good earnings. Also we executives will get a better break on our own profit-sharing bonus."

So runs the logic which has entirely written off plant and equipment, or inordinately slashed plant values below fair worth. In these dark days of corporate earnings all kinds of straws are grasped at to decrease losses. But it is incorrect and unfair to the corporation's own stockholders to turn out income statements in future years showing no or insufficient expense for depreciation, and it is unfair to competitors to fix prices below cost, which is what is apt to happen when depreciation is not considered an element of cost to be recouped in the selling prices determined upon.

Of course the old discussion arises as to what is depreciation and why it has to be included as an element of cost of doing business since it does not represent a cash outlay during the year reported on. However, it is now everywhere recognized that the wear, tear and obsolescence of the plant and equipment (the usage and wastage of capital) which occurs regularly each year does represent a cost to be considered and weighed in when stating the year's earnings. If the capital invested in plant and equipment is wiped off in one fell swoop instead of apportioned over the years of useful life these years will not absorb their proper share of this wearing-out process.

Adjusting Present Valuations

Out of the whole question comes this dominating consideration. After plant and equipment is written down or otherwise adjusted in value, will the future years' income account continue to bear fair and reasonable annual charges for depreciation of the plant and equipment actually in use during those years? If the plan of adjustment is such as to accomplish this result, then no serious quarrel can be picked over the manner, or the method, or the extent of adjusting present valuations.

From the balance sheet viewpoint it is somewhat a matter of whether one prefers vanilla or chocolate ice cream. Plant and equipment accumulated over a long period of years is bound to represent heterogeneous valuations, some low because of acquisition in days of low prices, some high because purchased or built in times of high prices. An enterprise is presumably in business to stay for many years. It spent money to acquire these assets and as they wear out or tend to become obsolete it is hoped and expected that the earnings derived from using them will pay back the original outlay. If any part has ceased to be usable, and would be gladly parted with if a buyer appeared on the horizon, then the money poured into such part, not yet recouped by depreciation charge-off, has gone for naught other than what such a buyer might be willing to pay for it. Writing down to market value plant and equipment definitely abandoned as unusable is proper and defensible. The loss in investment has occurred and in future these assets will not contribute toward earnings.

But what is the market value to which it should be written down? These days there is no real market for surplus plant and equipment so that it cannot be accurately determined. However, if based on good business judgment some round sum value is assigned at which it is believed during the course of the next few years the plant and equipment can be ultimately disposed of, then the enterprise will have acted fairly to adjust its valuations. Thereafter depreciation need not be charged off and when the assets are actually disposed of the difference between the assigned residual value and the price received will constitute the further adjustment one way or the other. There can be no dispute about this treatment of this sort of assets, and perhaps it is owed to stockholders to disclose to them on the balance sheet the unusable plant and equipment available for disposition at a value commensurate only with what it is expected can fairly be obtained.

Those corporations which assembled a group of subsidiaries and plants in the heyday of corporate mergers and set up on their books these plants and the equipment at their then appraised value, have had to take each year since a good healthy bite of depreciation. Construction costs have tumbled 25% to 30% since those years (so the Index shows) and machinery prices as much, if not more. Such consolidations approach this question of reducing depreciation by claiming that as the present sound replacement value of the assets is substantially below book worth that they should be written down to present worth. They counter the argument that cost must be recouped through the Operating Account by stating that it is not cost which must be recouped but an amount sufficient to replace the depreciating assets when their useful life has terminated. Or to put it another way, that since the lowered annual depreciation will eventually deduct out of earnings sufficient entirely to replace the assets, that it is not necessary, or right, to deduct amounts greater than will be necessary to replace them. They say if depreciation was continued on basis of the original high cost or appraisal value, earnings would be charged with an excessive amount. Thus, in the two schools of accounting thought and practice: depreciation should be on basis of (1) cost, (2) replacement value.

What is Sound Value?

No matter upon which side of the argument one finds himself, should a corporation write down its plant and equipment to present sound value less observed depreciation in order to lower the future annual depreciation charge, the action can scarcely be criticized as improper or as tending to inflate unfairly the earnings of future years. But what is sound value is even debatable. It is supposed to be the present cost to build or to acquire new. With a construction and machinery market as we have today —or rather lack of any market—we wonder whether currently quoted prices reflect sound value.

But he who seeks to follow some logic behind his determination to write down his company's plant, and would like to eliminate future depreciation entirely if he dared, advances the thought that not sound value, but market value should be the base. He points out that if a brand new competitor were to enter the arena, this competitor would go out and buy one of the many plants available, set up modern machinery which he can buy used from many dealers, and launch into business at a distinct advantage, because in future the low cost of his plant and equipment would make the depreciation charge very low.

Therefore, when asset values are to be adjusted our "depreciation-saver" contends they should be reduced to the point where future depreciation charges will enable the enterprise to compete with a new entrant into the business. Through such reasoning the executive wishes to cut his assets to "market value" in order to increase future earnings. "Distress value" is a better designation. A market presupposes buyers and sellers, and for the purchase of plants there are no buyers these days.

There are all kinds of variations of these approaches. Some believe that plant and equipment actually in use (though perhaps not to capacity) should be written down to sound value; such not now in use but intended and expected to be used in future should be reduced to market value to keep it competitive with new manufacturers; and such as is definitely set aside as not usable written off entirely or to a nominal amount. The reasons and the methods are as variegated as the colors of fashionable millinery.

In the struggle for more and better earnings, the U. S. Treasury Department stands adamant. The Income Tax Law provides that the actual cost of plant assets constitutes the base for the annual percentage charge-off of depreciation allowable as a deduction in income tax returns.

Twist balance sheet values as you will, slice depreciation to zero, and it matters not. When the tax return is prepared the old-fashioned allowance for depreciation must appear on line 22. So as not to be taken too literally it should be added that loss in useful value of plant and equipment may be deducted in the year sustained, but to secure this deduction it is necessary almost to establish that the plant has been abandoned and the equipment carted to the dump.

Adjustment in values may have some slight bearing on insurable worth, but whether left high or slashed low the insurance company will be guided by insurable values rather than book figures. In tax districts where book figures play some part in the judgment of assessors in fixing assessed valuation, writing down assets may result in decreasing taxes.

With all this movement toward deflating plant and equipment values, it has not yet taken the form of a grand rush. Many corporations are standing pat, feeling that the slough of the depression is no place from which to view the worth of plant and equipment—assets which have served for many years and will continue in future to serve in the quest for profits. They reason that as the future dawns they can chart their course toward earnings year by year, altering it when necessary, and analyzing and subdividing depreciation to meet the peculiar accounting and financial problems of the year and pointing out to stockholders the significance of these figures from the competitive angle. They feel the balance sheet should always show the cost of plant and equipment and its orderly extinguishment through regular depreciation charges. They believe that an established business should act like one and not juggle its cost of fixed assets.

Everyone knows that fixed asset account in the balance sheet is not taken literally as expressing the real worth of those assets. It normally presents what they have cost and what so far has been written off for depreciation. When assets go out of service it seems proper to add to Depreciation Reserve and deduct in the Income Account, or even in the Surplus Account, an amount for extraordinary depreciation and loss in value. Otherwise many executives feel that the gross or net value of assets actually usable, ready for use, and intended to be used, should be adjusted upward or downward to reflect changes from year to year in replacement worth or to give effect to lack of use or utility because of insufficient volume.

In retrospect we ofttimes wonder why we did the things we did in 1928 and 1929; why we followed practices that more sober thought proved faulty, even vicious. May we hazard the firm conviction that the "writers-off", who join the fashion parade of 1932-1933, will in a few years be moved to tears by the ill-becoming $1.00 value with which they clothed their plant and equipment?

Potash Industry in 1932

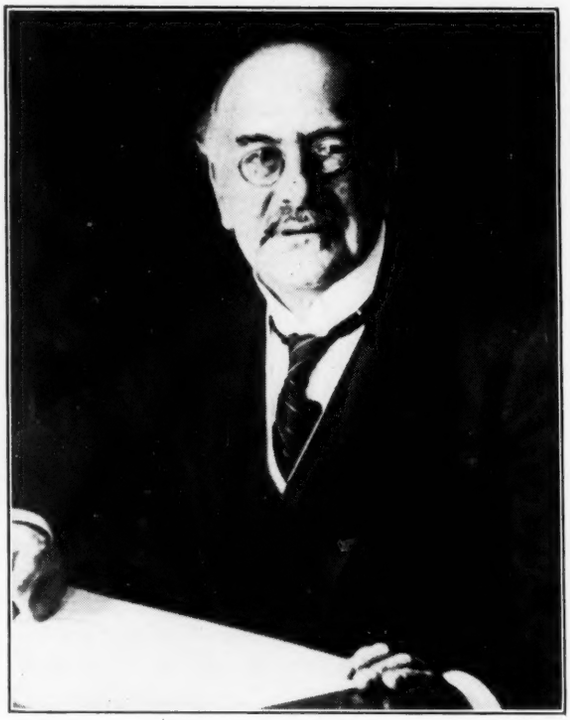
Potash produced in U. S. in 1932 amounted to 143,120 short tons of potassium salts equivalent to 61,990 short tons of potash (K_2O) according to a report of the U. S. Bureau of Mines. Sales by producers amounted to 121,390 tons of potassium salts with an equivalent of 55,620 tons of K_2O. Potash materials (domestic) sold by producers in 1932 were valued at $2,102,590. About 41,000 tons of potassium salts with an available content of 28,000 tons of K_2O remained in producers' stocks Dec. 31. Output increased 7 per cent. in gross weight with decrease of 3 per cent. in K_2O content. Sales decreased 9 per cent. with decrease of 13 per cent. in K_2O content. Total value of sales decreased 32 per cent.

Sales include material of which available potash (K_2O) ranges from 22 per cent. to 63 per cent. with an average of over 45 per cent. Principal sources of potash salts in 1932 were from salines at Trona, Calif., molasses distillery waste Baltimore, and crude and refined salts at Carlsbad, N. Mex. First refined salts were shipped from Carlsbad in 1932. Dust from cement kilns near Hagerstown, Md., was also utilized as a source of potash in 1932. Cotton boll ashes from cotton gins in Oklahoma and Texas were also sold for their potash content. Small quantities of alunite were shipped from Sulphur, Nev., and Marysvale, Utah, chiefly for experimental use as fertilizer material. Potash salts imported for consumption into U. S. in 1932, amounted to 330,964 short tons. Estimated K_2O equivalent of these imports was 113,505 short tons representing a decrease of 43 per cent. in gross weight from imports of 1931. Total value of imports was $8,841,838, 46 per cent. less than in 1931. Potassium salts imported chiefly for fertilizer amounted to 287,929 tons (K_2O content—96,170 tons), valued at $5,711,347, a decrease of 46 per cent. in gross weight and 53 per cent. in value. Potassium salts imported for chemical industry amounted to 43,035 short tons (K_2O equivalent—17,335 short tons) valued at $3,130,491, decrease of 11 per cent. in gross weight and of 27 per cent. in value.

Exports of potassium salts amounted to 887 short tons of potassium compounds (not fertilizer) valued at $241,179; 1,589 short tons of potassium chloride or muriate, valued at $54,223; and 445 short tons of other potash fertilizers, valued at $15,805. These figures represent a decrease of 23 per cent. in quantity and 35 per cent. in value for potassium salts (not fertilizer), of 95 per cent. in quantity and 96 per cent. in value for muriate, and 62 per cent. in quantity and 59 per cent. in value for other potash fertilizers.

Lord Melchett in Review

By A. E. Marshall



"ALFRED Mond, First Lord Melchett," according to the cover jacket, has been written by an author who believes it best to work on two books at one time—one biography and one novel—and who lays no claim to knowledge of the chemical industry or an acquaintance with Alfred Mond. The development of Mr. Bolitho's viewpoint of his subject, evident throughout the work, is best expressed in his own words, "The present biographer has passed from the calm state of interest, with which he began this work, to a deep affection for his subject: an affection which is all the more interesting because he never saw even Lord Melchett. Nor had he read anything about him, until he began to write this book. It is an affection which has grown out of letters and papers."

The author's frankness should not preclude criticism of mis-statements, nor does it make entirely acceptable an idealistic treatment of biography.

In discussing the importance of Dr. Ludwig Mond's contributions to ammonia-soda manufacture, Mr. Bolitho has permitted "affection for his subject" to color his views and so to award to Ludwig Mond the honor Mond himself had assigned to Ernest Solvay.

Mr. Bolitho says "The process finally perfected by Ludwig Mond had always been hampered in the hands of Solvay and others by two great difficulties . . . . Ludwig's great achievement was in overcoming these two difficulties. By staying in his works day and night, by adding, correcting and changing, he became master of the process. It was because he was a practical chemist that he was able to succeed where even the distinguished Solvay had failed." This was in 1873 when Brunner Mond and Company produced 838 tons of soda ash and Solvay 30,000 tons!

If the biographer had included in his literature studies Dr. Ludwig Mond's own classic paper "Origin of the Ammonia Soda Process" read before the Society of Chemical Industry in 1885, he would have found "It is now a matter of history how completely Mr. Solvay succeeded, after five years of incessant work, under trying circumstances, in inventing and working out new apparatus for carrying out on a large scale all of the various operations of Messrs. Dyar and Henning's beautiful but hitherto barren invention; how quickly the ammonia-soda manufacture has developed in his hands, and what enormous proportions it has attained in a comparatively short time. We have to give Mr. Solvay the honor of being the inventor of the apparatus, which alone has made this process of value to the public, and of having thus become the founder of the ammonia-soda industry."

Of all the characters in the book Ludwig Mond stands out most clearly, and it is evident that the author's acknowledgements to the "chemists, secretaries, friends and relations who have aided me in writing this book" must apply with particular force to the recreation of Ludwig Mond—it is too real to have been developed from documents. As Mr. Bolitho pictures Dr. Mond, he was forever absorbed in research, persistent in following his ideas and impatient when delays occurred. Work was all important, and we gather that when the ammonia-soda project at Winnington got under way, Mond's family life took second place, and even the boys, Robert and particularly Alfred, were remote objects in his affections.

It seems likely that Alfred Mond's boyhood was overshadowed by his father's intense personality, and that Alfred's early dislike of the chemical business was the boy's defense against a father who continually set the elder brother's scientific scholarship as an example and a pinnacle to be climbed. Certainly the later life of Alfred Mond indicates an unusual ability to grasp and present facts clearly and so leads to the belief that under more kindly and under-

standing conditions, the latent talents would have been evident at school and college. Mr. Bolitho, referring to Alfred's school days says "His father made him conscious of his own incompetence and, like all children whose actions are pruned and criticized by authority, he suffered adventures of imagination which led to shyness and despair." When Alfred failed in the Science Tripos at Cambridge and was sent down, he went to Edinburgh for a term, did real work and found himself.

Ludwig Mond appreciated the change in his son and, when he found Alfred still had no desire to enter the firm of Brunner Mond and Company—Robert was already a director and his father's personal assistant—Ludwig aided him in his decision to study patent law. Father and son now began a more understanding relationship and a better appreciation of each other. When Ludwig Mond formed the Power Gas Corporation and the Mond Nickel Company, Alfred's legal training proved invaluable, and father and sons together saw both companies through their formative and difficult stages.

The earliest ambition of Alfred to enter the English political arena must have persisted through the years of legal study and company organization, for we find him in 1900 standing for Salford as a Liberal and defeated on his South African "Peace with Dignity" platform. Thereafter he always lived in an atmosphere of business and politics.

When the war came to its end, the post of Commissioner of Works lost its importance, and when Mond discussed returning to business Lloyd George held him in the Government by appointing him Minister of Health. Sir Alfred Mond fought Socialism within his party for two years, and then realizing the Liberals had definitely changed their political faith, he renounced Liberalism and became a Conservative.

A year later he was elevated to the House of Lords and took the title of Lord Melchett. Once again his father's shadow intruded—perhaps it had never been far away—for when the question as to his selection of a title was asked he said "I don't want the name of Mond. That was my father's name. He made it great. I want my own name." So he chose Melchett, the name of his country estate.

In the House of Lords the atmosphere was chilly and snubs were frequent. Mr. Bolitho believes Lord Melchett was unhappy in his new political place, but whether it was a growing distaste for the House of Lords or because of the greater leisure the Lords enjoy over the Commons, he found time to devote to his business interests. In 1927 we find him engaged in reconstructing the executive control of Brunner Mond and Company and superseding Mr. Roscoe Brunner as chairman. Shortly after came the formation of Imperial Chemical Industries, an amalgamation of Brunner Mond and Company, Nobels, United Alkali and British Dyes. The reader of Bolitho's book will find this most important event quite sketchily treated and, he will be left at a loss as to whether the idea of amalgamation originated with Lord Melchett, Sir Harry McGowan or Mr. Reginald McKenna. Mr. Bolitho treats at some length the Melchett-Turner Labour Conference, and the Empire Economic Union, sponsored by Lord Melchett, which is alive today through its by-product Empire Free Trade. From his World Free Trade of Liberal days Lord Melchett had progressed to defensive tariffs and finally Free Trade within the Empire, and like all men who change in public expressions of their views, he had to face severe and unkind criticism.

The final of Lord Melchett's interests was the Zionist movement and his appointment as President of the Economic Board, whose principal activity was the settlement of Jews in Palestine. Ludwig Mond was a Hebrew, but his children had been permitted to follow their own religious opinions, and Alfred Mond, when he married a Christian, had acquiesced in his children being brought up in their mother's faith. Interest in the Zionist movement brought Melchett back to his father's faith, and so we find him valiantly battling for Zionism and vainly attempting to secure intervention in the Jewish-Arabian riots of 1929. The last phase came two months before his death, when the Zionists in Palestine turned on Melchett and accused him of defending the British Government against Zionism.

Mr. Bolitho has endeavored to paint a comprehensible picture of an extraordinary man, but his approach, while it has resulted in an excellent and vivid piece of writing, leaves one with an unsatisfied feeling. There are times when Alfred Mond comes to life in Mr. Bolitho's pages and is understandable, but Lord Melchett is always an enigma. Perhaps the difficulty does not lie with the author or his method but in the curiously changeable and difficultly understood person who was Alfred Mond, First Lord Melchett.

H. G. Wells has said:

A man who rouses my curiosity greatly is Sir Alfred Mond of Brunner Mond & Co. He is difficult to talk to; nervous, and either aggressive or defensive. He flounders about in politics and goes from party to party rather absurdly. I would give much to know what is his real philosophy, and if fundamentally he is anything coherent and determined. What at the bottom of his heart, if he has ever gone to such depths, does he think of parliamentary methods, of crown, of empire, of the war, and the rule of the world? Or does he just as a cat, accept house and master? Some of his kind do, but not I think he.

New Products and Processes

Anti-corrosive Pigments

A process has been perfected in Hungary for the manufacture of grey anti-corrosive pigments from bauxite. If pigments are made directly from this mineral, they are colored yellow or red by the iron-oxide content, but in the Hungarian process the mineral is first treated in a reducing atmosphere so as to convert the iron into a stable grey-ferrous oxide. It is stated that this pigment possesses particularly good properties, especially in linseed oil or varnish media.

Sugar Purification

Experiments on use of ignited bauxite in defecation and decolorization of sugar-cane juice have been carried out by F. Hardy, of the Imperial College of Tropical Agriculture, Trinidad, British West Indies. Reports indicate that ignited bauxite is an efficient agent. It appears to yield purer and paler syrups than either kieselguhr or lime. It has further advantage over lime in that it introduces no additional solutes into the juice, in which respect it resembles a high-grade kieselguhr.

Absorbent Coating

An absorbent aluminum oxide coating can be produced on articles made of aluminum or of alloys containing at least 50 per cent. of aluminum by immersion in or by spraying with aqueous solution of sodium carbonate and potassium bichromate, with or without applied electrolysis. Coating is then colored by treatment with a solution of potassium permanganate.

Dewaxing Solvent

Trichlorethylene was suggested as a dewaxing solvent in treatment of petroleum instead of benzene by Dr. Nils Olaf Backlund in a talk given at a congress of Polish petroleum technologists.

Litharge Manufacture

A new Russian method claims an exceptionally high degree of purity for litharge. This involves solution of the lead anode in a specially designed electrolytic cell, followed by separation of the lead hydroxide and dehydration of the latter by precipitation with an alkaline solution. After washing with water to remove the last traces of electrolyte, the litharge is ready for use. Calculations show electrolytic litharge to be cheaper than that produced by the ignition method, while risk of lead poisoning is reduced to a minimum since the whole process is carried out under water. Electrolytic litharge is regarded as a valuable raw material for optical glass owing to its freedom from metallic lead, which results in a higher degree of transparency.

Improved Concrete Resistivity

Resistivity of concrete against the attack of water can be substantially improved by impregnating with arsenious acid, according to a recent Swedish patent. By coating or spraying the surface with an aqueous solution or suspension of arsenic anhydride satisfactory results may be obtained. For more solid constructions, such as bridges, dams, and quays, it is recommended that the impregnating agent be applied by means of pressure, in order to attain a more thorough penetration of the concrete mass.

Traffic Paints

A series of paint materials for traffic markings on highways and streets has been developed. New products are designed to stand up under severe weather and other conditions which most markings are subject to. Four of the new products are quick drying similar to lacquer.

Sugar for Fuel

Sugar has been added to alcohol, coal tar distillates and coke gas as possible fuel for European motor cars. As compared with coal dust, sugar possesses the advantage of being ash-free for internal combustion engines.

In the chemist's fuel, 25 kilogs of sugar are dissolved in 75 litres of alcohol containing 5 c. c. of nitric acid. After cooling, about 30 grams of nitrated sugar and naphthalene are added to solution, naphthalene acting as denaturant. Excess free acid is neutralized with alcoholic ammonia, leaving a liquid, ash-free combustible fuel.

Pure Tungsten

New process for manufacture of pure tungsten has been based on the dissociation of tungsten hexachloride at high temperatures. Described by A. L. van Arkel in "Revue Universalle des Mines." 1932, pages 37-41, reaction is carried out in a chamber resembling a large electric bulb containing a single tungsten filament which is electrically heated to 1,500° C. Mixture of tungsten hexachloride and commerical tungsten powder with which the vessel is filled is heated to 300° C. when cyclic operation is initiated, the hexachloride coming into contact with the strongly heated tungsten filament splitting up into the pure metal and chlorine, while the latter reacts with the impure tungsten on the floor of the chamber with reformation of the hexachloride. A feeble current is required at the outset for heating up the tungsten filament to the required temperature of 1,500° C., but the steady increase in the thickness of the filament as the result of continuous deposition of pure tungsten calls for an increase in the current strength to 300 amperes after the reaction has been in progress for 3-5 hours. It is said that the method has also been extended to the production of zirconium and titanium in the pure form.

Uses for Waste Gases

Under recent Norwegian patent (No. 47,380) Norsk-Hydro is now exploiting waste hydrogen and chlorine gases resulting from alkali chloride electrolysis. Hydrogen is converted into synthetic ammonia which is subsequently worked up to ammonium phosphate with the aid of phosphoric acid obtained by reaction of waste chlorine with calcium phosphate and carbon monoxide. Phosphorus oxychloride is obtained by this reaction, which is decomposed by water with formation of phosphoric acid.

Waterproof Material

Cavalite, a new light-weight, waterproof material, consists of a special rubber compound applied to a pure silk fabric in such a way that the finished product is all one unit. It is an opaque fabric and has the appearance of leather with a silken sheen. Women's raincoats made of the material weigh less than a pound.

Motor Oil Purification

A new way to purify motor oil. Heretofore motor oils have been purified with sulfuric acid, the expense of which made complete removal of impurities economically difficult. Impurities, moreover, came out in the form of a useless black sludge. New process uses a recently developed solvent beta dichloroethyl ether. It removes all impurities more cheaply and when they are out they make good furnace fuel.

Chemical Facts and Figures

Nitrogen Conference in N. Y.

Francis P. Garvan's introduction to the Zanetti Nitrogen Report, in which he wrote "so secret were the proceedings that only one copy was signed by the different companies involved and then only with initials, and this secret copy deposited in a safe deposit in Germany" was vividly recalled the last week of April when international leaders of the nitrogen industry, gathering in N. Y. City, all entered vigorous denials that they were here for a conference, or even knew of the presence of their proposed conferees in the city.

Rumors that such a conference would be held here, current for several weeks, attracted wide interest as this was the first time that such a gathering has ever been held in the U. S., at least, to the knowledge of the industry at large. CHEMICAL MARKETS has been informed from an unimpeachable source, however, that such a conference was called.

Those in the city for the meetings (scheduled to start April 24, but which actually did not get under way until two days later) included Baraet Quarles van Ufford of the Staatsmijnen, government subsidized ammonium sulfate producer at Liuburg, Netherlands (Mr. Quarles is reputed to have been one of the signatories of the European nitrogen cartel); F. C. Speyer of the I. C. I., who arrived via Canada;* and Dr. W. Jacoby, high I. G. legal official.

Possible Reasons

Several plausible theories for holding such a meeting here are advanced. It is, of course, known that the synthetic producers of Europe are working in fairly close accord at present. The unknown factor is what course of action the Chilean group (Cosach-Chilean Government-Guggenheim combination) will take with the end of the present natural-synthetic agreement in sight (July 1). With Cosach headquarters in N. Y. City, those suggesting the necessity of working out a future pact between the natural and synthetic producers in order to maintain the present status quo, point out that a meeting here is most logical. Others in the industry voice the opinion that foreign nitrogen producers are viewing with alarm the growth of the export business of the U. S. synthetic producer, Atmospheric Nitrogen, particularly with France and Japan. Still others report that the synthetic producers did not wish to meet in Germany at present because the German Farmers' Union was suing the I. G. for selling material outside of Germany at prices considerably below those asked in home markets, and that the French and Belgian manufacturers refused to meet in England while the I. C. I. and the Ducth factors frowned upon Paris; that finally the U. S. was picked as a neutral corner. The last theory does not seem to hold water for it appears the European synthetic producers are already in accord and the meeting seemed quite definitely to have been arranged to bring together the natural and synthetic producers.

*Mr. Speyer returned to England May 2.

Dr. Jacoby (I.G.) Interviewed

Dr. Jacoby, head of the legal forces of the I. G., who arrived on the Europa April 24, accompanied by Frau Jacoby, and registered at the Waldorf-Astoria, denied emphatically in a private interview with CHEMICAL MARKETS that he was the advance guard of a larger German delegation to an international conference or that he was to represent the I. G. at any nitrogen meeting here. Dr. Jacoby, slim, rather short, dark-haired, extremely well dressed, youthful, almost boyish in appearance, speaking perfect English, insisted that he was here largely on a pleasure trip, but with an engaging smile, admitted that as the I. G. offices were but a few blocks away he might take up some problems that have arisen in connection with the momentous events of the past few months both in Germany and America. As to conditions in Germany, Dr. Jacoby said that the last report of the I. G. showed a very moderate but encouraging pick-up in business internally and in export trade; that the advance in fertilizer sales had approximated 10 per cent. He denied that there was any truth to the report that the Farmers' Union was suing the I. G. He stated that, while no European nitrogen cartel was now in existence, the majority of producers had an understanding whereby each others' markets were respected by outside manufacturers. "Of course" continued the Doctor "because of its overwhelming size and importance in the field, the I. G. plays the most important role in this arrangement."

"I am sufficiently acquainted with your laws," he added, "to know that a nitrogen meeting might encounter possible difficulties. Besides, there is still plenty of time—the present agreement does not expire until July 1."

Dr. Jacoby attributes unstable nitrogen conditions to the political importance attached by each country to the maintenance of a fixation program, based not on commercial requirements, but upon possible war demands. Questioned on the possible renewal of the agreement of France to buy large quantities of nitrogen from the I. G., Dr. Jacoby expressed the opinion that France is making strenuous efforts to expand its nitrogen industry rapidly, and is looking hopefully to the time when it will be entirely independent of outside sources.

German Political Situation

Asked about Hitler, and the political situation in Germany, Dr. Jacoby expressed his belief that contrary to general belief in this country, Herr Hitler is a strong character and has in a amazingly short period welded Germany into one Reich, ready to present a new united front. "We still have, of course, all our problems such as unemployment, disarmament, parity, etc., unsolved."

Coincident with the arrival of the representatives in this country nitrate prices were advanced $1 a ton. The statistical position of Chilean nitrate stocks both in this country and in most other parts of the world has improved slightly. This together with the fact the outlook for revival of trade due to the activity of the administration in Washington in preparation for the World Economic Conference seems to indicate that the natural and synthetic producers will bend every effort to reach some sort of an agreement which will maintain prices at least at present levels and may even bring about higher levels. The outlook, quite dark a few months ago, seems to be brighter as a result of the happenings of the past 60 days.

Alcohol-Gasoline Measures

Forty cent corn failed to dampen the ardor of proponents of compulsory alcohol-gasoline mixtures for automobile fuel. The latest addition to the list of bills before the House Ways and Means Committee, sponsored by Rep. Shallenberger (Dem. Neb.) provides for a mixture of only one per cent. for the remainder of 1933, two per cent. alcohol blends for the calendar year 1934, and five per cent. thereafter. As in all of the other proposals of a similar nature, prohibitive taxes are suggested upon gasoline not containing grain alcohol.

Wave after wave of specially prepared publicity is being released on the one hand by the advocates of this measure, "designed to pull the farmer out of the hole," and on the other, by the petroleum companies and other agencies such as the American Petroleum Industries Committee In every instance, of course, the "best foot is put forward." It becomes increasingly evident that some impartial tribunal will have to pass upon the technical questions in dispute.

Unexpected Set-back

Quite unexpectedly on May 3 proponents of the measure received a set-back at the hands of Senator "Pat" Harrison, chairman of the Senate Finance Committee. He refused to accede to the request of Chester C. Davis, representing the Motor Fuel Alcohol Committee (group pushing alcohol blend bill) that a bill, similar in nature to the House (Shallenberger) measure, be attached to the measure continuing the federal gasoline tax for another year. Committee refused to give time to testimony. Senator Harrison, in explaining this action of the Committee, stated "This is a new question with a lot of angles. It was decided not to consider it at this time."

Mr. Davis indicated later that he would seek an investigation by Congress of the merits of his proposal, with a view to considering later legislation on the question. The Mississippi Senator did add, however, later in the hearings, that efforts will be made to work out a joint resolution setting up a sub-committee of the Finance Committee to work in co-operation with the House Ways and Means Committee to study all angles of the situation. He did not expect a report on the matter, however, before the next session of Congress.

From present indications it is unlikely that any of the House measures will receive now the active cooperation of the President, but, on the other hand, it is thought in administration circles that he will not oppose any. The petroleum interests have been successful in their attempt to force the legislation through the regular channels, subject to careful debate, rather than being jammed through as an administration emergency farm relief measure. While it is known that Secretary Wallace of the Dept. of Agriculture favors the idea of grain alcohol-gasoline mixtures, he has not indicated how far he intends to back the scheme. The report of the economists of the department is said to be about ready for release.* Feeling now exists in several places that the inflationary program of the administration, boosting up prices precipitously in the last three or four weeks, has sounded the death-knell of the scheme in this session, and that it will be difficult to revive it unless the inflationary measures fail to establish prices at a higher level. Failure of federal legislation, however, will simply arouse the sponsors to double their efforts in the corn-producing states.

*Report states manufacture of alcohol from farm products would be an aid to taking care of agricultural surpluses; that most gasoline engines now in use could handle 10% alcohol-gasoline mixture without adjustment and without change in mileage per gal. of gasoline; that increase in farmers' buying power (increasing his consumption of fuel) might offset loss of initial lower consumption of gasoline, the use of 2% anhydrous alcohol would add ½c cost with corn at 50c and gasoline at 13c. Use of 10% alcohol would add 2 3-5c a gal. and utilize 560,000,000 bu. of corn and 112,000,000 bu. of barley.

†Reports state I. G. April export business dropped considerably as a result of boycott.

Metz In Germany

General Herman A. Metz warned Germany in a speech delivered before the American Chamber of Commerce in Berlin April 20:

"We (Gen. Metz was accompanied by Victor Ridder, treasurer of the *N. Y. Journal of Commerce*) are not here to butt in on Germany's business and criticize, but merely to call the government's attention to what is likely to happen in the U. S. if certain things continue in Germany."†

Shoals Legislation

McSwain-Hill-Almon Muscle Shoals Bill (H. R. 5081), slightly revised from its original form, passed the House April 25 by a vote of 306 to 91. Motion to substitute less drastic Norris measure failed, 326 to 68.

House bill "makes it the duty of "the government (The Tennessee Valley Authority):

(1) To manufacture nitrogen at Muscle Shoals on a large scale.

(2) To make phosphoric acid and other fertilizer ingredients, it finds that production of nitrogen is not economically justifiable. Fertilizer industry interprets this to mean if the government finds "it cannot drive private enterprise out of the nitrogen field!"

(3) To buy fertilizer ingredients that it does not itself produce, and make both normal and concentrated fertilizers ready for the farmer's use.

(4) To lease the plants if the Authority so chooses, but if it does, this must "insure mass production of fertilizer and/or fertilizer ingredients." In short the combined efforts of Messrs. McSwain and Hill would precipitate the government into the fertilizer industry "with both feet".

Hearings before Chairman McSwain's Military Affairs Committee were held, April 11-20. N. F. A. Secretary, Brand, appeared before the committee April 14, again armed with a mass of statistics. Much of his testimony was a repetition of statements made at previous hearings over the past 12 years. Turning to former chairman of the committee, Representative James, Mr. Brand said he regretted that "he had to listen again to this tiresome story." Continuing, he remarked that he saw no occasion for putting the government into business. "Don't knock out a window to kill a fly" was his parting "shot" to the Committee.

Slight Concessions

While opposition before the Committee was unsuccessful in eliminating most of the obnoxious features, it did secure a slight compromise in that the Authority is instructed that it shall first seek to lease nitrate plant to private owners on a 50 year contract. Failing in this after 18 months board would then begin federal operation. Committee specified that operator must manufacture a minimum of 10,000 tons of fertilizer for first three years, and henceforth step up production to capacity as fast as demand increases. President was authorized to suspend terms of contract in event private operator was unable to sell fertilizer produced. Profit of eight per cent. above cost of production would be permitted.

Senate Passes Norris Bill

On April 11 Senator Norris introduced his bill in the Senate. On April 12 Senate Agricultural Committee reported out the bill in 12 minutes. The outstanding proponent of Muscle Shoals legislation apparently has come to the parting of the ways with some of his most ardent cohorts in the lower house for he refused to substitute the McSwain-Hill measure for his own. Sharp differences of opinion are readily discernible in the provisions of the two bills. The Norris measure embodies, it is felt, the plans of the

COMING EVENTS

The Electrochemical Society, Montreal, May 11-13.

Tanners Council, Seasonal Leather Opening, Hotel Astor, N. Y. City, May 8-9; Spring meeting, White Sulphur Springs, May 12-13.

Third Premium Exposition, Hotel Stevens, Chicago, May 15-19.

Natural Gasolene Association of America Hotel Tulsa, May 15-17.

American Petroleum Institute, Mid-year Meeting, Hotel Mayo, Tulsa, May 17-19.

American Leather Chemists' Association, Hotel Claridge, Atlantic City, June 7-9.

American Institute of Chemical Engineers, Chicago, June 14-16.

Eleventh Colloid Symposiums, Madison, Wis., June 15-17.

National Fertilizer Association convention, White Sulphur Springs, Greenbrier, June 19-21.

American Society for Testing Materials, Chicago, Hotel Stevens, June 26-30.

American Electroplaters' Society, Chicago, Congress Hotel, June 27-30.

American Association of Textile Chemists and Colorists, Annual Meeting, Chicago, September.

American Chemical Society, Chicago, Week of Sept. 11.

National Petroleum Association, Annual Meeting, Hotel Traymore, Atlantic City, Sept. 20-22.

American Association Natural Gas Dept., Chicago, Sept. 25.

National Metal Congress and Exposition, October 2-6.

Twenty-second Annual Safety Congress, Hotel Stevens, Chicago, Oct. 2-6.

Federation of Paint & Varnish Prod. Clubs, Edgewater Beach Hotel, Chicago, Oct. 26.

National Paint, Oil & Varnish Association, Edgewater Beach Hotel, Chicago, Oct. 27-30.

Exposition of Chemical Industries, Grand Central Palace, N. Y City, Dec. 4-9.

American Society of Mechanical Engineers, N. Y. City, Dec. 4-9.

Fifth National Organic Chemistry Symposium, Cornell, Dec. 28-30.

Local-N. Y. City*

May 12—Joint Meeting, Society of Chemical Industry (in charge).

May 19—The Electrochemical Society.

June 2—Joint Meeting, A. C. S. in charge.

President for the flood control, reforestation, navigation and general development of the river valley region with fertilizer production incidental to water power development. In the House bill advocates of cheap fertilizer (irregardless of cost to the taxpayer) have seized the opportunity to legislate through a strictly class measure frankly designed to appeal to the farmer.

Whatever views the Nebraskan Senator held at one time on government commercial operation of the nitrate units, he now is of the opinion that they are now largely obsolete and should only be employed in a limited way largely for experimental purposes. Even on power he does not advocate permanent government operation, but only as a corrective. In the light of the developments incident to the passage of the McSwain-Hill Bill the fertilizer industry is beginning to look upon Senator Norris as a conservative.

The Norris bill passed the Senate on May 3, 63 to 20, after a short but acrimonious debate. Efforts of Senator Bankhead to substitute the House fertilizer provision was defeated, Senator Norris leading the opposition. The venerable, white-haired Nebraskan heatedly promised "to resign in 10 minutes if anyone could show that the President favored the House bill. The amendment providing authority for leasing Plant No. 2 to a private company for manufacture of nitrogen fertilizer or fertilizer ingredients was offered at the last minute as a concession by Senator Norris. It provides that the No. 2 plant be leased to the American Farm Bureau Federation or others.

Attacks Farm Bureau

Charging the Farm Bureau with originating propaganda that fertilizer could be manufactured by a private corporation at Muscle Shoals cheaper than ever before produced, Senator Norris declared:

"If these people are right, here is a chance to carry out the boasts they have made for the past 12 years."

It will now be necessary for the two houses to appoint committees to attempt to iron out the differences in the two bills.* Opponents are hoping that they will be unable to reconcile the wide differences of opinion or, if the McSwain-Hill version is retained, that the President will find it so at variance with the spirit of his message of April 10 as to veto it. Opponents are frankly doubtful that "fate will deal so kindly with them however."

*Norris-McSwain conference May 9 indicates victory for former on fertilizer provision.

From the N. F. A. "*Fertilizer Review*"

The N. F. A. timed the appearance of its latest issue of The Fertilizer Review beautifully. Entire issue is devoted to presentation of facts showing the entire lack of necessity for fertilizer production at Muscle Shoals. Actual capacity for nitrogen production in this country is reported to be 500,000 tons annually and an added potential capacity of another 200,000 tons in case of war. Peak consumption occurred in 1929 when 432,000 tons were used up—70 per cent. of it for fertilizer purposes. Figures show an accumulated surplus of 93,745 tons in 1932, built up over the past five years.

A. A. C.'s president, Horace Bowker, and President John J. Watson of the I. A. C. were interviewed. The former felt that the rapidity with which the situation was changing was such as to prevent him from commenting on the newer aspects of the problem.

I. A. C.'s Watson Interviewed

Mr. Watson was inclined to take a somewhat similar view. "There is really very little new that can be said on the subject" stated the I. A. C. president. "The question has been before the country for a long time, and the issues are well defined. Certainly anyone thoroughly acquainted with the problem and able to view it from an unbiased, disinterested viewpoint, knows that there is no necessity for the production of fertilizer at Muscle Shoals; that the industry is today suffering intensely from overproduction." "We have in this country" continued Mr. Watson "right now facilities for nitrogen fixation two to three times in excess of our needs; that if it were necessary to add productive capacity this could be done more economically in other directions.

"The program" pointed out Mr. Watson "as outlined, may endanger the efforts at balancing the budget. The Muscle Shoals plants," concluded the head of International, "should have been considered years ago a war measure, just as the emergency fleet was, the loss taken, and the question removed from the hands of politicians who for selfish reasons have continued to keep it alive."

Supply, Consumption, and Surplus of Chemical Nitrogen in the United States, 1928-32.

(Short tons of Nitrogen)

	1928	*1929*	*1930*	*1931*	*1932*
Supply					
By-product	170,000	187,600	164,250	117,130	76,300
Synthetic	26,000	84,000	135,000	66,000	89,000
Net imports	241,500	196,700	136,830	118,300	65,480
Total supply	437,500	468,300	436,080	301,430	230,780
Consumption					
In mixed fertilizers	185,000	188,000	170,840	121,670	88,390
As fertilizer materials	116,000	116,000	122,810	80,370	73,265
By other industries	125,000	128,000	110,000	90,000	65,000
Total consumption	426,000	432,000	403,650	292,040	226,655
Surplus each year	11,500	36,300	32,430	9,390	4,125
Accumulated Surplus	**11,500**	**47,800**	**80,230**	**89,620**	**93,745**

N. F. A. Statistics.

Foreign

Chilean Sales Plan

Finance Minister Gustavo Ross announced May 7 government's new plan for reorganization of Chile's nitrate industry which is similar in outline to Cosach, monopoly ordered liquidated last January.

Plan, which must be submitted to Congress and to the nitrate interests, would establish a sales corporation to acquire nitrate and iodine from producers at cost plus $1.50 a ton of nitrate.

Twenty-five per cent. of the profit would go to the State, a part would be devoted to servicing the industry's debts, and the rest would go to the producers.

Finance Minister asserted that State's share would be used to continue liquidation of Chile's foreign debts, a move which presumably is designed to offset recent criticism of various foreign countries over alleged discrimination against their respective nationals engaged in the nitrate industry here.

Plan suggests that producers and the government form sales corporation, with producers assuming their own debts but with producers guaranteeing State 140,000,000 pesos (currently about $8,400,000) this year. A similar guarantee obtained under the Cosach arrangement.

Sales corporation would be authorized to issue $57,000,000 worth of dollar bonds to exchange for prior-secured bonds of Cosach members, but nothing was said about ordinary bonds.

All nitrate stocks affiliated companies have on hand would be acquired at the rate of £3 (now about $11.19) a ton. It was said that the stock purchases would be 20 per cent. of the sales up to 1,000,000 tons this year, and 33 per cent. over a million. This is designed to guarantee continuation of production, despite the present huge reserves.

Sales arrangements would be based on two-thirds from the Guggenheim plants—a major part of the dissolved Cosach—and one-third from independent plants.

German Survey*

Recent survey of the German chemical industry by *Die Chemische Industrie*, official organ for the Union for Protection of German Chemical Interests, points out latest developments. Special mention was given to following: Method of producing caustic soda direct; potassium ferricyanide process of sulfur removal from illuminating gas; absorption of nitric oxides from ammonia oxidation direct to high concentration nitric acid; increase in chlorine fixation to chloride of lime; non-injurious insecticides; methane as motor fuel; viscose sponges; nitrification of nitro-cellulose sheets; new source of tylose, protective colloid; further perfection of "Tornesit," protective wood and metal coating and innovations in solder production.

In so-called Kiflu caustic soda process, contrary to electrolysis, no chlorine, otherwise hard to dispose of, occurs. Furthermore, Kiflu process evaporates only 4.94 cu. meters of water per ton caustic soda production, compared with 6.41 cu. meters in caustification of soda. This would entail less cost in fuel consumption.

Because of its lack of sulfur Germany is showing much interest in the potassium ferri-cyanide process for separating sulfur, according to cable advices May 7, from coke-oven gas. Costs of removal are said to be only two-thirds of old dry process. Process is in use by the Hamburg Gas Works and in West German coke plants, latter using iron hydroxide.

Production of high concentration nitric acid heretofore has been by dehydrating dilute nitric with sulfuric. A new direct synthesis of high concentration nitric is now in use that absorbs nitric oxides formed in ammonia oxidation. It is stated that nitric costs in this case are decreased from 172 marks per ton to 150 marks.

In production of solid chloride of lime, it is reported that chlorine led into a specially constructed revolving shaft is, says the same report, combined to an extent of over 95 per cent. with water gas that is practically free from chlorine.

In search for cheaper motor fuel, concentrated methane was used in Germany last year where one cubic meter of gas corresponds in effect to one kilog. of liquid fuel. Cheaper production possibilities from wood distillation are now discounted, experiments having shown that for production of one horse power one to one and one-half kilos of wood are consumed, two to two and one-half kilos of wood corresponding to one liter of gasoline and costing but five pfennigs.

An important advance in production of nitro-cellulose is indicated in nitrification of sheets of nitro-cellulose boards, avoiding use of nitrification jars and making dispensable heating apparatus for acids, special circulation apparatus and dehydration turbines.

*Report of William T. Daugherty, U. S. Berlin Trade Commissioner.

Other innovations were organic polyhalogen compounds, such as naphthalene, tetra-chloride, perchlor-pentane, in combination with organic carrier substances. They do not decompose until solder temperature is reached with formation of HCl. Interesting results have been attained in the field of cellulose derivatives, paint products and solder.

German Exports*

German exports of heavy chemicals in 1932 to U. S. were 58,182 tons, valued at nearly 9,800,000 marks. Exports of these items to all countries totaled 359,707 tons. Total exports and those to U. S.:

	—Metric tons—	
	Total	*To U. S.*
Antimony compounds	509	38
Arsenic acid and compounds	3,459	410
Bleaches and peroxides	26,016	628
Blue vitriol	9,820	603
Calcium chloride	16,053	3,152
Cryolite (synthetic) and aluminum compounds	30,895	1,026
Cyanides, Soda and potash	4,677	1,072
Epsom salt	36,875	4,209
Lactic acid	1,531	255
Oxalic acid	3,486	145
Potash carbonate	12,224	2,989
caustic	30,688	2,253
chlorate and perchlorate	10,892	4,850
Soda chlorate	2,017	272
sulfate	160,411	34,625
Sulfides, soda and potash	5,210	599
Tartaric acid	3,034	610
Zinc salts	2,000	446

Immediate establishment in Montreal of a Canadian branch plant of Hall Chemical, of London, England, and possible early establishment of branch plants of other British industries in Quebec and Ontario were announced by S. Gerald Soman, former secretary to late Lord Melchett, on his arrival in Montreal late in April.

Leading asphalt companies of United Kingdom have formed association to make all asphalt resources jointly available to members in an effort to assure a product of specified characteristics.

Dominican Republic has provided that nitric, picric and sulfuric acid; nitrate of potassium, mercury, sodium and ammonia; nitroglycerine; pure anhydrous glycerine; sulfur, fulminate of mercury; potassium picrate; sodium sulfite; potassium chlorate; and sulfide of antimony may be imported only under permit from the Secretary of State for Public Works, under regulations he may establish. No shipment of these products may be withdrawn from customs without this permit. No amount of these products may be sold except under prescription by a doctor, and in a reasonable quantity for human use during only 24 hours, or, under written order from Secretary of State for Public Works, for quantities necessary for industrial use.

March Employment

Factory employment in chemical industries in March retained practically all of the gain made in the preceding month, government records showing a change of but 0.1 per cent., downward. Payroll totals, however, declined two per cent. Last year, employment declined 0.5 per cent. in March, and payroll totals, 1.3 per cent. In comparison with March, 1932, employment this year showed a decline of 4.4 per cent., and payroll totals were off 16.1 per cent.

Index number of Bureau of Labor Statistics for employment in factories manufacturing chemicals and related products was 76.4 for March (100 = monthly average in 1926), compared with 76.5 in February and 79.9 in March, 1932. Bureau's index number for payroll totals (same basis) was 58.5 for March, compared with 59.7 for February and 69.7 for March, 1932.

Employment

	Mar. 1933	*Feb. 1933*	*Mar. 1932*
Chemicals	86.4	86.8	88.9
Cottonseed oil, cake, and meal	38.4	40.6	46.5
Druggists' preparations	69.8	70.5	79.6
Explosives	75.7	76.2	77.9
Fertilizers	67.4	56.7	63.9
Paints and varnishes	63.3	64.2	74.2
Petroleum refining	62.8	62.7	65.2
Rayon and related products	142.0	149.1	143.7
Soap	93.7	95.1	96.8

Payroll Totals

	Mar. 1933	*Feb. 1933*	*Mar. 1932*
Chemicals	60.2	61.4	70.9
Cottonseed oil, cake, and meal	33.0	34.1	45.3
Druggists' preparations	66.5	70.0	79.7
Explosives	47.7	47.0	56.4
Fertilizers	36.3	32.6	42.7
Paints and varnishes	43.5	47.3	65.0
Petroleum refining	53.2	53.0	60.1
Rayon and related products	114.5	121.0	133.1
Soap	76.3	78.0	89.4

Changes in employment in the various divisions of the chemical group in N. Y. State were reported as follows:—

	March compared with February (percentages)	
	State	*City*
Drugs and industrial chemicals	—3.8	—4.7
Oil products	—2.3	—0.2
Paints and colors	—2.0	—2.4
Photographic and miscellaneous chemicals	—0.3	+3.4

Employment Statistics

National Research Council survey, made by Charles J. West, shows that in 1930, 1,430 industrial chemical laboratories reported 33,596 chemists and engineers employed; in 1933, 1,467 laboratories (47 more than in 1930) report 21,464 employed, a 36 per cent. decline.

Chemical Foreign Trade of the Major Exporting Countries

	—Exports—			—Imports—		
	1931	*1932*	*Percent. decline*	*1931*	*1932*	*Percent. decline*
Germany	$244,000,000	$172,300,000	30	$78,500,000	$52,500,000	33
United Kingdom*	94,000,000	74,100,000	21	105,300,000	58,600,000	44
France	98,500,000	69,900,000	29	73,000,000	58,200,000	21
Belgium	52,600,000	38,000,000	28	44,800,000	26,000,000	40
Netherlands	41,600,000	33,300,000	20	47,500,000	37,300,000	22
United States	130,600,000	95,100,000	27	118,200,000	72,000,000	40

*Figures should probably be 10 per cent. higher and are exclusive of the Irish Free State.
Note.—All figures are preliminary and subject to correction.

In The Courts*†

Tubize Chatillon has reacquired by outright purchase from N. J. Zinc, all American, Canadian, English and European patents issued to James A. Singmaster, pertaining to delustering of artificial silk or rayon by the use of pigments. Ownership of these patents was recently awarded to N. J. Zinc, by decision of Judge Caffey of U. S. District Court (N. Y.) in litigation brought to establish ownership.—(CHEMICAL MARKETS, Apr. p, 340.)

Singmaster Will Appeal

While the agreement between Tubize and N. J. Zinc closes all litigation between these companies CHEMICAL MARKETS learns on excellent authority that Mr. Singmaster plans to appeal the decision to the District Court of Appeals and will file papers just as soon as the decree of the lower court has been officially entered. It appears unlikely now that the case can be brought to trial before the summer recess. The case has attracted wide attention because of the several novel and unusual questions of patent law that are involved.

Du Pont Licenses Sylvania

A settlement out of court has been reached in suits brought by Du Pont Cellophane against Sylvania Industrial Corp. in District Courts of Delaware and Virginia for infringement of patents owned by Cellophane Company and covering moisture-proofing of Cellophane. Sylvania Industrial Corporation has taken a license under Du Pont Cellophane Company's patents for manufacture and sale of moisture-proof regenerated cellulose. Du Pont Cellophane's patents as granted by Patent Office broadly cover new moisture-proof articles and also process and apparatus for making them.

Steel Decision Appealed

Notice of appeal has been filed in U. S. District Court, Baltimore by Electro-Metallurgical (Carbide & Carbon), and American Stainless Steel, Pittsburgh, a patent holding pool, in their infringement suit against Rustless Iron of America. Judge William C. Coleman in U. S. District Court handed down a decision March 1, last, favoring Rustless Iron Corp. (CHEMICAL MARKETS, Mar. p. 242).

Electro-Metallurgical charged infringement of the Clement patent, a product claim, and of the Hamilton-Evans patent, a process claim.

U. S. has practical monopoly of world's cornstarch industry, being the only country that produces this commodity in appreciable quantities. In 1929 U. S. produced 1,046,168,489 pounds, the largest in the history of the industry. Preliminary figures for 1931 place total production at 742,253.928 pounds.

*See also Paint & Lacquer Section, p. 444.

†Briess on Commercial Solvents' contempt proceedings against Union Solvents filed May 10. Decision expected by May 13.

American Dryice Corp. has acquired Dryice Corp. of America. Executive offices are at 205 42nd st., N. Y. City. American Dryice will continue to maintain warehouses in all of the principal cities throughout the country east of the Rockies where its predecessor had done business. Officers have been identified with the solid CO_2 industry for years and are well known to the trade. F. A. Rogers is president; E. R. Lawrence, vice-president and treasurer; W. M. Laughton, secretary; T. B. Ganser, asst. secretary and asst. treasurer; G. C. Cusack, sales manager; Dr. C. L. Jones, chief engineer.

Freight Rate Changes

N. Y. P. S. C. has approved reduced freight rates of Lehigh Valley on crude coaltar, in tankcars, carloads, minimum weight as per rule 35, from Buffalo, East Buffalo, Harriet, Niagara Falls and Suspension Bridge to Utica, on N. Y. O. W., 9c per 100 cwt., reductions from class rates; effective May 8.

Commission also approved on April 16 lower freight rates on phthalic anhydride, carbon tetrachloride, hydrogen peroxide, sodium cyanide, sodium perborate, sulfur chloride, and trichlorethylene from Suspension Bridge to New York and Brooklyn. New rate is 25c per cwt., carloads, tank cars or less than carload.

Commission also has approved lower freight rates on following oils shipped on Long Island: coconut, cottonseed, corn, palm, palm kernel, peanut, soya bean; also sunflower seed, carload or tank car quantities. Rate from Long Island City to Corona is 9½c per cwt.; from Blissville docks to Corona, 9½c, and from Bay Ridge to Corona and Long Island City, 11½c, effective May 8.

N. Y. P. S. C. has approved reduced rates of N. Y. C. (East) on glycerin, other than crude, in tank cars, carload minimum weight, as per rule 35, from New York, Brooklyn, and vicinity, to Rensselaer 22½c and to Rochester 28½c per 100 cwt; reductions from class rates, effective May 15, 1933.

Obituaries

Arthur M. Comey

Arthur M. Comey, 71, retired du Pont chemist, died at his home at Cambridge, Mass., on April 7. Dr. Comey was, from 1906 until his retirement in 1921, director of du Pont high explosive laboratory in Chester, Pa. Previously he had been a consulting chemist and also a professor of chemistry at Tufts for four years and an instructor at Harvard for three years.

Born in Boston Nov. 10, 1861, Dr. Comey was graduated from Harvard in 1882 and received his Ph.D. degree from Heidelberg. In 1885 he married Miss Kate Coleman of Lafayette, Ind., who died in 1931. They had traveled extensively after Dr. Comey's retirement.

Member of many technical societies and and an officer in several, Dr. Comey was a fellow of the American Academy of Arts and Sciences, and in 1917 became chairman of the subcommittee on explosives of the National Research Council. His dictionary of chemical solubilities, first published in 1896, with a second edition in 1921, has long been considered a standard work of reference. Dr. Comey leaves a son, Arthur C. Comey, Assistant Professor of City Planning at Harvard.

Waldo Lincoln, 83, a chemical manufacturer from 1832 to 1894 at Worcester, Mass., died April 7. He was a noted historian and was a past president of the American Antiquarian Society of Worcester.

Mrs. Ola Craige Gibbons Huntington, 60, wife of Warner D. Huntington, former Davison Chemical vice-president, and for the past few years, director of fertilizer sales for Cyanamid, committed suicide April 19, by jumping from 15th story window of a Philadelphia hotel. Mrs. Huntington had been suffering from a nervous breakdown.

U. S. Chemical Trade

After the large percentage declines—averaging 25 per cent—in exports of chemicals and allied products evident the past three years, exports for first quarter of 1933, amounting to $21,720,000 in value, were only 14 per cent. below those for the corresponding quarter of 1932. Rate of decline in imports, which has been at an even greater extent than that for exports, was likewise arrested and equaled only 20 per cent. Exports during the first quarter of 1933 continued to exceed imports by nearly $5,000,000.

Quite a few chemicals recorded increases, especially in quantities shipped during first quarter. Particularly noticeable were the large amounts of crude coal tar and coal-tar pitch exported, bringing total value of $3,433,000 of all coal-tar products shipped 50 per cent. more than for the corresponding quarter of 1932. Larger amounts of the industrial alcohols, menthanol and butanol, and some of the other synthetic organic chemicals were shipped to foreign countries.

Thompson Hayward Expands

Thompson-Hayward Chemical has purchased Western Scientific Supply of Denver and will continue to operate offices and warehouse of the purchased company as a Denver branch. This purchase increases number of Thompson-Hayward branches to 12 in addition to Kansas City plant.

Association News

Willstaetter—Gibbs Medalist

Dr. Richard Willstaetter of Munich, Nobel Prize winner in 1915, famous for his outstanding contributions in organic chemistry, has been selected to receive Willard Gibbs Medal for 1933, one of the highest American honors in chemistry.

Medal will be presented to Dr. Willstaetter in Chicago, Sept. 13, during the 86th A. C. S. meeting, to be held in connection with the Century of Progress Exposition. Award is made annually by the Chicago section.

Schoellkopf Medal

Professor of Physiology, Frank Alexander Hartman, University of Buffalo, has been selected to receive 1933 impression of the Jacob F. Schoellkopf Medal for meritorious chemical accomplishments within the territory of the Western N. Y. Section of the A. C. S. Doctor Hartman is cited for his preparation and use of a hormone extracted from the cortex of the suprarenal gland which he named "Cortin" and which bears same relationship to Addison's disease that insulin does to diabetes mellitus.

Schoellkopf Medal was established by Western N. Y. Section in recognition of Jacob F. Schoellkopf, dye manufacturer, one of the first chemical industrialists in Buffalo. First impression of the medal was given in 1931 to Frank J. Tone, president of Carborundum Co., and second to William Hale Church, Du Pont Cellophane.

Chemists' Club (N. Y.) has available two annual scholarships—known as the Victor G. Bloede ($500) and William F. Hoffman ($400) scholarships. Committee on appointment meets June 1. Data is obtainable from Allen Rogers, Chemists' Club Bldg., or Pratt Institute, Brooklyn.

Dr. Gustave Egloff, Universal Oil Products, will present a paper "Synthetic Petroleum Products "before a joint meeting of the four N. Y. Sections of the technical societies (Society of Chemical Industry; A. C. S.; Electrochemical Society; Societe de Chimie Industrielle) May 12 at the Chemists' Club.

The 30th annual meeting of the American Leather Chemists' at Atlantic City, June 7-9, Hotel Claridge, will feature Prof. Edmund Stiasny, outstanding German tanning expert. Reports of the Research Laboratory at Cincinnati will be read.

Speakers at local A. C. S. meetings in April included: Chicago, Carleton Ellis, "Polymerization, Condensation, and Chemistry of Coatings;" Dayton, R. N. Shreve, "Studies in the Dye Field"; Detroit, Oliver Kamm of Park, Davis; the latter also spoke before the Erie Section; Kanawaha Valley, Alexander Silverman, "Glass"; Philadelphia, M. E. Barker, "The Work of the Chemical Warfare Service"; Toledo, C. C. Nitchie, "Spectroscopy."

Princeton Chemistry

Elmer Smith, chairman of the golf auxiliary, Chicago Perfumery Soap & Extract Association, and Chicago Drug & Chemical Association announces that first tournament will be played about the middle of June.

Borden Co.'s director of research, Lawrence W. Bass, spoke April 13, before the N. Y. Section, A. I. C., on "The Chemist in the Diary Industries." Dr. Bass is a member of the consulting editors' board of CHEMICAL MARKETS.

George F. Applin spoke on "Ether" before the Chemical Club of Philadelphia on April 10.

Rossville Commercial Alcohol's Chicago divisional manager, C. A. Mackintosh; Clyde C. Marshall, vice-president and general manager of Petrolagar Laboratories; and Maxwell R. Hott, sales manager for Pepsin Syrup, have applied for membership in the Chicago Drug and Chemical Association. Association's Annual Spring Dinner Dance held April 27 in the Parisian atmosphere of the Paris Ballroom of the Opera Club was an outstanding success.

Personal

Now President Conant!

James Bryant Conant, Sheldon Emery Professor of Organic Chemistry, was

Leaves laboratory desk to run Harvard, the second scientist in 293 years to head the University.

named by the Harvard Corporation May 8 to be next president of Harvard University. Confirmation of choice will be laid before the board of overseers June 22. One of the youngest in the long line of Harvard presidents, Professor Conant is in his 41st year.*

Regarded since the early days of his career as one of the most brilliant of the younger generation of chemists, Professor Conant is widely known among scientists for his research work in special fields. Last year he received the Chandler medal, and the William H. Nichols medal.

*May 10 Prof. Conant welcomed press to Harvard Yard—first time privilege granted in over 20 years.

Taylor, Mendel Medalist

Dr. Hugh S. Taylor was presented May 4 with the Mendel Medal, awarded annually by Villanova College, to Catholics who have achieved distinction in advancement of the sciences. Medal was presented by Rev. Dr. Edward V. Stanford, president.

Pickney L. Frost, newly appointed assistant manager of sales for Innis, Speiden, was stricken with appendicitis while in Buffalo. He is at the Deaconess Hospital. George A. Bode, R. & H. manager in N. Y., is back after a serious operation.

George H. Lincks, varnish gum importer, N. Y. City, celebrated his 44th anniversary in gum business, April 25.

Dr. Cornelius Szalagyi, Chemical Works of Gedeon Richter, Ltd., Budapest, Hungary, is in N. Y. City.

A. C. S. president, Arthur B. Lamb, has been elected vice president of the American Association for the Advancement of Science in charge of Section C for 1933.

Dr. Victor K. LaMer, chemistry professor at Columbia, and Roy F. Lindquest, eastern representative for the Ayer Co., are new Chemists' Club (N. Y.) members.

Personnel

Baker Castor Oils' president, Kendall Marsh, and W. F. Meredith, president, Titanium Pigment, are new National Lead directors, succeeding George O. Carpenter and Charles E. Field. Baker Castor Oil has been closely allied with National for years, and the latter has now acquired entire control of Titanium Pigment.

Z. Gerber is with Orelite Co., Inc., distributors of kieselguhr, 117 Liberty st., N. Y. City. Mr. Gerber was for years with the old Miner-Edgar firm.

Max Hecht, formerly chief chemist, Duquesne Light, is now consulting engineer, specializing in power stations chemistry at 5859 Northumberland st., Pittsburgh.

E. L. Lasier is now with Titanium Alloy Manufacturing, Niagara Falls.

R. C. Denny is new chief engineer of the Patterson Foundry & Machine, stoker division. M. Edgar Yeager, Chamber of Commerce Bldg., Boston, is new New England manager of stoker sales.

O. Max Gardner, former North Carolina governor, is now general counsel for the rayon industry, with headquarters in Washington.

George Moran, former chief chemist, Pacific Print Works, Lawrence, Mass., has joined sales technical service division of Calco, replacing C. A. Funke, who resigned to join Nova Chemical (CHEMICAL MARKETS, April, p. 348). In his new capacity, Mr. Moran will direct technical service division in the printing and dyeing of Calco Fast Colors, and has established headquarters at Bound Brook.

Paul H. Mantz has resigned from Pittsburgh Station, Bureau of Mines, and is now employed as physical chemist by A. C. Spark Plug, Flint, Mich.

E. M. Toby, Jr., is now in charge of the southern sales office of American Mineral Spirits, 724 1st National Bank Bldg., Atlanta.

Edwin A. Robinson is now with Tennessee Eastman, Kingsport, Tenn., working on experimental production of cellulose acetate yarn.

Clarence W. Sondern, Fritzsche Bros. Fellow at University of Wisconsin, has completed doctorate work and is now research chemist with Wm. S. Merrell Co., Cincinnati.

Minor C. K. Jones, former chief chemist, Consolidated Gas Electric Light & Power, Baltimore, has opened consulting offices at 1828 Greenmount ave., Baltimore.

Franklin T. Hickox, was elected president and general manager of Consolidated Mercury Mining, Morton, Wash., relieving F. B. Prescott.

R. E. Horn is general sales manager for Abbott Laboratories. Dr. F. B. Kirby, formerly sales manager, has been made educational director.

N. Y. Section Legislative Service

Drug, Chemical and allied trades section of N. Y. Board has just completed a digest of the new retail sales tax which will be imposed upon receipts from sale of tangible personal property as of May 1. "Legislative Bulletin No. 1 is the beginning of a service which has been started with the idea of informing members of the section of various legislative measures effecting chemical and drug industry.

Devine Co.'s New Service

N. Y. Engineering is now fabricating material for C. P. Devine Co. Latter has started new service to manufacturers, making complete technical and economic surveys of existing plants and equipment. Further details may be obtained by writing company's offices at 25 W. 43 st. N. Y. City. Robert ("Bob") Holliday has been added to the company staff as a consultant.

Company News

Carbide at Exposition

Carbide will exhibit a wide variety of products at the Chicago "Century of Progress" including complete welding equipment, synthetic organic chemicals and also the "Age of Plastics"—an entire section devoted to "Vinylite" plastics. In the Hall of Science, "Fair" management has planned to set up huge "Periodic Table of Elements," in which will be collected in one place for the first time, specimens of all known chemical elements. In search for these specimens, it was found that Carbide is the only practical source of a large percentage of the 92 elements. Almost one-half of these are being furnished by Carbide.

B. F. Goodrich has a new rubber lined valve known as the Vulcalock valve, which is designed for handling corrosive and abrasive fluids under conditions of fairly high pressure, pulsating pressure, throttling or suction.

New Ethyl Sales Policy

Ethyl Gasoline Corp. has decided to offer to its holders of Ethyl manufacturing or non-manufacturing agreements tetraethyl lead to be used in gasoline other than Ethyl grade. Product will be offered as "Q" brand of anti-knock compound and its use may be started June 1.

Corporation restricts use to gasolines to be sold at a price next highest to Ethyl gasoline. Minimum quantity of tetraethyl lead which may be mixed with gasoline will be 3-10 of a cubic centimeter a gallon, and the maximum 1½ cubic centimeters. Maximum allowed on Ethyl grade is three cubic centimeters. Minimum specifications for base gasoline with regard to volatility, gum and sulfur will be similar to those for Ethyl gasoline. Maximum anti-knock value of the treated gasoline containing the "Q" compound will be 70 octane. Fluid will be colored in accordance with wishes of individual licensee, any distinctive color except red being supplied.

Interstate Color moved from 41 Park Row to 5 Beekman st., N. Y. City, May 1.

Chester F. Hockley was appointed April 24, receiver for Silica Gel in the U. S. District Court, Baltimore, under a bond of $25,000. Petition for receivership was filed by Pyrites Co., Inc., of Wilmington, Del., which claims to be a creditor in excess of $3,000.

Foster D. Snell, Inc., chemists-engineers, have moved to 305 Washington st., Brooklyn.

Brown Instrument, Philadelphia, has developed new type of battery for use with Brown Potentiometer, which eliminates frequent standardizing. This new battery, Brown Compensated Air Cell, having a constant current output and a life of over two and one-half years assures potentiometer user of continuous accuracy with minimum attention. It can be used with all types of Brown Potentiometers. A bulletin describing the Brown Air Cell can be obtained from the manufacturer.

Operations to fortify milk and bread with vitamin D under Zucker-Columbia University process have been started by Sanitary Farm Dairies of St. Paul; Rockford Dairies, Rockford, Ill.; and Alexander Bros. Baking Co., Topeka. National Oil Products manufactures the concentrate under license.

Wilson Q. Buster, Inc., is a newly organized soap company, in Kansas City, Mo. A. R. Wilson, formerly vice-president of Vestal Chemical, St. Louis, is president.

New Orleans Chemical, has started manufacture in New Orleans of insecticides and shaving creams at its new plant, 635 Decatur st. that city. H. T. Underwood is president.

Jungmann & Co. has moved to 157 Chambers st., N. Y. City.

Monsanto's official name on and after June 1 will be Monsanto Chemical Co.

Schneidau & Devlin, 1028 Maritime Bldg., New Orleans, has added to its line Annis dry type air filter for ventilating and industrial purposes, manufactured by Coppus Engineering, Worcester, Mass.

Ross Barbour Cataract Chemical, Buffalo, N. Y., is now a member of the American Leather Chemists' Association.

Schuch Chemical, products for prevention of scale and corrosion in boilers and radiators, has established a plant and office in Norwood, Ohio. Officers: President, W. B. Hart; vice-president, L. E. Schuch; secretary-treasurer, W. E. Schuch.

Cyclone Chemical, Buffalo, has been organized by Walter Berg and associates, to operate plant for manufacture and distribution of chemical products for household use.

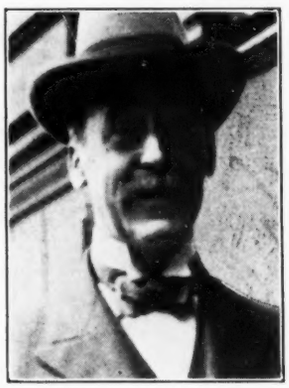
C. M. Durbin Co., 49 Central ave., Cincinnati, are sales agents for Glyco Products.

Chemical Fads and Fancies

Penn. Salt director of research, Arthur E. Gibbs, returned April 3 from a two months European trip.———Bayer Co.'s vice-president, E. I. McClintock, is chairman of the Drugs and Pharmaceuticals Division of the Trade and Industry Committee of the Salvation Army United Appeal.———Langmuir's Nobel Prize check read 171,000 kroner, about $31,000 before we left gold.———Edward J. Cornish, vice-president of Patino Mines & Enterprises and chairman of National Lead (a new position created when Mr. Cornish relinguished the presidency) told stockholders of the mining company that block tin sales were better with beer back.———I. C. I.'s head, Sir Harry McGowan as much as told his stockholders he is a bear on the U. S.——— Mr. and Mrs. Elon H. Hooker announced during past month engagement of eldest daughter, Miss Barbara Ferry Hooker, to Eugene A. Nebolsine, son of a former Russian admiral. A younger daughter became Mrs. John D. Rockefeller, Jr., late last year.———The toastmaster at the recent Drug and Chemical Section, N. Y. Board of Trade dinner sailed on the "Manhattan" recently. Mr. Huisking will visit Wheeler & Huisking of London and Devold Oil Co. in Norway.——— H. H. Rosenthal has returned from his trip to the Orient.———The coldest man-made temperature was produced recently at University of California—just 427.1° F. below freezing! The mark is said to be within .25° C. of the absolute absence of heat. Substance cooled was gadolinium sulfate octahydrate.—No, you will not find it in the Price Section.———The

A. I. Ch. E. head sees potential demand for 2,000 graduates a year

A. C. S. was definitely organized on April 20, in N. Y. City fifty-six years ago.———Vincent Riggio, American Tobacco vice-president, has purchased the 112-acre McKesson estate in Chappaqua, N. Y.———T. S. P. is now cleaning golf balls on several courses.———W. L. Sweet, president of Rumford Chemical Wks., is president of the Manufacturers' Merchandise Advertising Association. ———"Charlie" Thompson of Thompson, Hayward was in N. Y. City during April. ———Dr. J. V. N. Dorr, president of the A. I. Ch. E., told Pratt Institute students that, despite the crisis, there is a potential demand from industry for about 2,000 chemical engineering graduates each



Prof. G. T. Morgan now heads 92 year old Chemistry Society (British)

year.———Prof. G. T. Morgan, past president of the Society of Chemical Industry, (British) was elected president of the Chemical Society at its 92nd annual meeting.———The latter organization is the oldest chemical association in the world. At the anniversary dinner, Lord and Lady Melchett; Sir Ernest Benn, publisher of *Chemical Age*; Sir Henry Dale, speaker at the recent Merck Laboratory dedication; and others prominent in British chemical circles, were guests.———The John Harrison statue by Lawrence Tenny Stevens (he did the CHEMICAL MARKETS' Medal) will be unveiled this summer, on the 100th anniversary of the death of the "father of American industrial chemistry". The statue will be placed in front of the John Harrison Laboratories of the University of Pennsylvania.———Father Julius A. Nieuwland of Notre Dame, discoverer of a method for the manufacture of synthetic rubber has been elected a fellow of the Chemical Society (London). It is not generally known that he formulated the Lewisite gas principle in 1904 while doing his Ph. D. work at Catholic University. Last November he announced a new paint or lacquer S. D. O.(synthetic drying oil), which becomes hardened shortly after being applied to a surface and is henceforth insoluble in all solvents. It makes wood, concrete, and other porous materials waterproof.———Arthur W. Kretschmar, a well-known N. Y. City importer of drugs and chemicals, died April 19 on his 50th birthday.———The Attorney-General has drafted an executive order transferring the Bureau of Industrial Alcohol from the Treasury to the Department of Justice.———The coming Chemical Exposition will have a brewing section.———August Zinsser was elected a member of the executive committee of the Washington Square Association (N. Y. City).———Lorenzo A. Wilson, chairman of the board of Wilson & Toomer Fertilizer, was married recently. ———Lord Melchett spoke on "Modern Economics and Unemployment" April 28 before the Chemical Engineering Group of the Society of Chemical Industry.——— Billings Wilson, assistant general manager of the Port of New York Authority, spoke April 20 before the Drug and Chemical Section, N. Y. Board of Trade. ———Celebration of the 50th anniversary of the discovery of the nickel deposits at Sudbury, from which Canada has built a world industry was featured by a speech by Robert C. Stanley, International Nickel president, at the 34th annual banquet of the Canadian Institute of Mining and Metallurgy at Toronto April 6.———James G. Vail's photograph of one of his two children won the second photo contest of the N. Y. Chemists' Club.———The financial papers report that pools were operating in Monsanto and du Pont in the past month.——— N. F. A. secretary, Charles J. Brand, was directly on the firing line in Congress during the debate on the Muscle Shoals Bill. Within an hour or so after the sponsor of the bill Hon. Lister Hill (Ala.) stated that "The American farmer must buy each year over half of all the nitrogen that he uses either from Chile or from Europe" the N. F. A. had a letter in the hands of each congressman showing how erroneous the Alabama Representative's facts were.———William S. Gray, Jr., at the age of 36, president of Hanover Bank & Trust, N. Y. City's third largest bank, was elected a director of Carbide recently.———Carbide's vice-president, F. M. Becket, is proving to be a very active president of the American Institute of Mining and Metallurgical Engineers. ———After four years of intensive research chemists of the Miami Valley Coated Paper Co. have succeeded in "fragrantizing" coated paper, opening up an entirely new field of sense appeal. Recently a "best seller" was printed on scented paper. Back to lavender and old lace!———The mystery of how the ancient Egyptians obtained the characteristic fine blue on their pottery has been solved by Dr. Charles F. Binns of the N. Y. School of Ceramics, Alfred, N. Y. ———Fred Klebart, sales manager of J. B. Ford, Wyandotte, Mich., has just returned from a business trip to Mexico. ———Pierre S. du Pont was a guest at the Washington Gridiron Dinner April 29.———The father of Mrs. Charles M. Schwab, the late Reuben Dinkey, was the first steel chemist in America.

Heavy Chemicals

Monsanto Buys Swann

Monsanto sprang the prize depression-period acquisition surprise April 20 when President Edgar M. Queeny announced purchase with cash of a control of the voting stock of the Swann Corp. for an unannounced sum. Revising the famous Greeley advice Monsanto came East in 1929, acquiring Rubber Service Laboratories, the Commonwealth Division of Mathieson, and, storming the citadel of New England conservatism, Merrimac. Now firmly believing in the future industrial growth of the South the company has turned to Swann Corp.

The Swann interests within the past five years have acquired Swann Chemical of Birmingham, Provident Chemical of St. Louis, and Wilckes, Martin, Wilckes of Camden, one of the country's oldest lampblack producers. Research has had a champion in Theodore Swann. Besides a long list of more orthodox products his technical assistants have made available di-phenyl, the archlors and a highly concentrated fertilizer which, it was reported at various times, Mr. Swann hoped to produce at Muscle Shoals. Last year a great amount of publicity was given to the company's ambitious program of sales expansion. Mr. Swann after the most intensive chemical consumption survey ever attempted, covering 22 states, authorized the opening of several new offices in various parts of the country.

The new acquisition strengthens materially Monsanto's position in the heavy chemical field and brings it into the phosphate markets in a really big way. This latest acquisition is another step further in the conversion of the Monsanto organization from a producer largely of fine chemicals to one with a very wide diversification of products.

The following eight officers of Monsanto were immediately elected to the Swann Board of Directors; Edgar M. Queeny, Charles Belknap, Gaston du Bois, Theodore Rassieur, J. A. Berninghaus, J. W. Livingston, F. A. Ulmer and G. Lee Camp. The following members of the old board were reelected: Oscar Wells, Chairman, First National Bank of Birmingham; William H. Weatherly, Chairman of the First National Bank of Anniston; Ferdinand Wilckes of Camden; William H. Hassinger, Lindley C. Morton, Theodore Swann and C. M. Jesperson of Birmingham. Mr. Swann was reelected president.

New Sodium Sulfate Source

Anglo-Chilean Consolidated Nitrate recently completed its drying plant at Maria Elena, which has a capacity of 7,000 tons per month of sodium sulfate to be recovered as a by-product from nitrate operations. System of operation at Maria Elena contemplates two days in the production of nitrate and three days on sulfate. By removing most of the water operators expect to effect sufficient saving on freight to enable them to sell at a price advantage in other markets. It is reported that liquidating commission of Cosach is attempting to find markets abroad for sodium sulfate and that 1,250 metric tons were sold in Sweden.

German imports of sulfur underwent further sharp contraction in 1932, dropping by around 36 per cent., to 49,696 metric tons from 78,154 tons in 1931, and as compared with 82,355 tons in 1930, and 120,434 tons in 1929. Of the total imports in 1932 U. S. furnished 37,473 tons compared with 56,991 tons in 1931. Italy's share of the German trade dropped sharply to 7,920 tons in 1932, compared with 20,180 tons in 1931.

An interesting development of the German trade in 1932 was the appearance of Norway and Chile as suppliers on a notable scale, former country furnishing 1,752 tons, and latter 1,267 tons in 1932, compared with no shipments at all in 1931.

Italian production of copper sulfate first nine months of 1932—749,963 quintals (6,675 tons), an increase of 23 per cent. over 1931.

Sulfur Through New Orleans

Resumption of sulfur shipments through Port of New Orleans has been effected after a lapse of several years, with indications that 150,000 tons will be handled during current period. First shipment was 2,000 tons via steamer Nordvengen to Aruba, West Indies, April 1, and second 2,000 tons via steamer Raimund to Hamburg, April 15. Other shipments include 5,000 tons via steamers Haimon to Continental ports, between 3,000 and 4,000 tons via steamer Ilona Siemers to Aruba, West Indies, and approximately 7,000 tons on two other steamers. Sulfur originated at plant of Jefferson Lake Oil, near Abbeville, La.

Bauxite in 1932

Shipments of bauxite from mines in U. S. in 1932 were 96,349 long tons, valued at $548,168, a decrease of 51 per cent. in quantity and of 52 per cent. in total value, as compared with 1931, the United States Bureau of Mines reports.

In Alabama, bauxite shipments (all for use in the chemical industry) were 15 per cent. more than in 1931. Shipments from Georgia in 1932 (all for use in the chemical industry) were 57 per cent. less than in 1931. Shipments of bauxite from Arkansas in 1932 were 89,779 long tons, a decrease of 52 per cent. from 1931.

Producers of domestic bauxite reported sales during 1932 at prices ranging from $4 to $12.11 a long ton. The average for Arkansas bauxite was $5.65 a ton, for Alabama and Georgia $6.16 and for U. S. $5.69.

Mutual Personnel

Mutual Chemical has closed down temporarily bichromate plant at Jersey City. Oxalic is being produced there as usual. It is reported that Dr. Herbert H. Kaufman, vice-president, is now in Europe. Enoch L. Perkins, former mines manager at New Caledonia, is now acting as a sales assistant to President Frederick W. White, in place of E. J. Barber who resigned recently.

Langbourne M. Williams, Jr., new Freeport Texas president, states that estimated earnings of company and wholly owned subsidiaries during first quarter of 1933 exceeded common stock dividend requirements for that period, after all charges including allowance for preferred dividends. Construction operations at Grande Ecaille, new sulfur property under development in Louisiana, are well under way and production is expected to commence next January.

Methanol and Acetate of Lime Data

Monthly statistics on production, shipments, and stocks of methanol and acetate of lime, based on data reported to the Bureau of the Census by thirty-four establishments, are presented in the table below:—

Methanol

	Gallons						
Refined—	*1931*	*1932*	*1933*		*Totals 2 months (Jan.-Feb.)*		
Wood distillation—	*February*	*February*	*January*	*February*	*1931*	*1932*	*1933*
Production	223,144	111,280	165,860	117,236	531,917	291,782	283,096
Shipments	225,279	106,811	59,546	88,435	392,648	218,864	147,981
Stocks, end of mon.	465,311	222,368	324,489	353,290	.....	.....	.....
Synthetic—							
Production	662,735	546,086	352,748	339,300	1,432,288	1,131,966	692,048
Shipments	402,650	473,993	512,781	625,484	913,353	860,876	1,138,265
Stocks, end of mon.	1,614,975	2,149,697	3,050,641	2,764,457	.....	.....	.....
Crude—							
Production	478,272	224,508	312,481	256,826	1,019,747	433,983	569,307
Shipments	*	*	244,185	272,505	*	*	516,690
Stocks, end of mon.	486,452	419,985	297,163	281,484	.....	.....	.....

Acetate of Lime

	Pounds						
Production	7,073,296	2,848,989	4,741,827	3,747,754	15,015,492	5,342,876	8,489,581
Shipments	3,518,468	3,557,068	1,713,308	1,963,434	8,713,134	6,555,913	3,676,742
Stocks, end of month	28,932,342	8,615,811	10,162,338	11,946,658	.....	.....	.....

New Activated Carbon

Industrial Chemical Sales, N. Y. City, is offering new activated carbon, a pound of which will remove objectionable odors from 100,000 gal. of water. Col. J. Wrench reports one cubic inch of this activated carbon possesses a total of 20,000 square yards of external and internal surface. An ounce contains more than 2,000,000,000,000 particles. Unusual property of this activated carbon in absorbing odors and tastes caused by microscopic vegetable growths common in all reservoirs, is due to extremely minute division of the substance. Company has available complete data.

Higher tensils in rubber mixings are reported obtained by a new type compounding powder which is an isomer of calcium carbonate, or whiting, in which the colloidal calcium carbide content is 42.21 per cent. Particle size improves wetting power.

Russia fared poorly in the alkali trade last year. Caustic exports declined from 27,753 tons in 1931 to 11,552 tons in 1932. Ash shipments also fell from 25,678 tons to 22,463 tons. Bicarbonate, however, improved from 4,907 tons in 1931 to 6,731 tons last year.

Dutch East Indies companies interested in starting an aluminum industry have founded a bauxite mining company in the island of Bintam. Latter company hopes to cut in on American companies now supplying Japan with 10,000 tons of bauxite annually.

Binney & Smith report further improvement in the physical condition of dustless "Micronex" special carbon black in pellet form.

Manhattan Soap Sales, N. Y. City, dealing in soap, etc., has been chartered at Albany with $10,000 capital. E. Myron Bull, Hugh W. Reid and Harry J. McIntyre, 100 Broadway, were named directors and subscribers.

German exports of chloride of magnesia dropped heavily in 1932 to a total of 21,197 tons.

According to unofficial reports, negotiations among French sulfur refiners resulted in an agreement which would suppress disastrous effects of strong price competition experienced during 1932 and facilitate a normal campaign for 1933.

Solvay's Syracuse plant has expanded operations with opening of navigation on the N. Y. State Barge Canal. All-water shipments of ash are being made to Atmospheric Nitrogen's Hopewell, Va., plant.

Recently introduced process for manufacture of sodium hyposulfite electrolytically in England is said to result in purer product at much lower cost than that obtained by zinc reduction and other chemical reduction methods.

Selling Davison Acid

R. S. Mueller Co., broker has been made selling agent for sulfuric turned out by Davison Chemical, arrangement being with the receivers. Mueller Company, Garrett Bldg., Baltimore will handle only acid, being sole agent. Contract covers indefinite period. Receivers named Feb. 15 have until present handled the marketing of acid themselves.

Grasselli has been awarded Richmond, Va., contract for 300 tons of alum at $1.35 per 100 lbs., or $20,000, and 60 tons of chlorine at a cost of $2,520.

It is understood says "The Broad Street Gossip" (*Wall St. Journal*) that "United Carbon for first quarter will show profit of $120,000 after depreciation and depletion. This would be equivalent to 20c a share on 370,127 shares of no par common after allowing for quarterly dividend on 7% preferred, on which dividends have been omitted. Natural gas sales increased. In first quarter last year profit was $61,667. Reports are also current that United Carbon has won a law suit in which $600,000 is involved."

Westvaco Chlorine Products Corp. has declared quarterly dividend of 10c on common, placing issue on a 40c annual basis, payable June 1 to stock of record May 15. Last previous payment was a dividend of 25c made June 1, 1932, after which disbursement was omitted in August, 1932.

Lime Statistics

Through 1931-32 market for chemical lime has been restricted by the decline in manufacturing operations in several divisions of the industry. Despite this condition, prices have remained fairly firm. Sales by producers in the U. S. in 1931 aggregated 2,707,614 tons, which had a valuation of $18,674,913. This was a decrease of 20 per cent. in quantity and of 27 per cent. in value as compared with 1930 when sales totaled 3,387,880 tons, with a value of $25,616,486. Sales of lime used in the manufacture of chemicals totaling 1,463,217 tons and valued at $9,810,514, decreased 20 per cent. in quantity and 26 per cent. in value; lime sold for construction, 947,085 tons, valued at $6,940,250, decreased 21 per cent. in quantity and 31 per cent. in value; and that sold for agricultural purposes, 297,312 tons, valued at $1,924,149, decreased 13 per cent. in quantity and 19 per cent. in value. The following table shows sales of lime by uses in 1930 and 1931:—

	1931	
Use	*Short tons*	*Value*
Agricultural	297,312	$1,924,149
Building	947,085	6,940,250
Chemical—		
Glass works	59,148	345,780
Metallurgy	290,352	1,714,368
Paper mills	286,745	1,781,793
Refractory lime (dead-burned dolomite	243,769	1,866,971
Sugar refineries	18,185	211,625
Tanneries	54,604	372,321
Other uses	510,414	3,517,656
Total chemical	1,463,217	$9,810,514
Grand total	2,707,614	$18,674,913
Hydrated lime, included in above totals	1,119,266	7,729,047

Japanese sulfur interests, owing to yen depreciation, are expected to be able to increase shipments to other markets considerably. Matsue Sulphur Mines, it is learned has arranged for shipment of about 10,000 tons to U. S., Australia and New Zealand.

Metals and Alloys

Tin Restriction

Malayan Government recently approached Malay Chamber of Mines to get its view regarding continuance of the tin restriction after August, 1934. Malay Chamber consulted London committee which replied in favor of continuation. Tin Producers' Association which met April 12 also agreed unanimously to cable Malayan government in favor of continuance of restriction. Some individual high-cost British producers would like to get larger quotas, but all agreed in their wish to continue the restriction of output.

Statement in London newspaper that Bolivians have made an offer for majority of shareholdings in most important Far Eastern tin smelting company, which obviously refers to Consolidated Tin Smelters, is denied.

Quantity of magnesium ingot sold or used in 1932 was 191,699 lbs., valued at $228,653. This represents an increase of 36.3 per cent. in quantity and 14.5 per cent. in value compared with 1931. In 1932, as in four preceding years, domestic output of primary magnesium was all obtained from magnesium chloride recovered as a joint product of the salt wells of Dow Chemical.

New Chrome Steel

Soviet scientists are reported to have succeeded in discovering silicic chromic steel with high content of chromium which resists 60 per cent. solution of phosphoric acid. They also found an alloy of copper, aluminum, iron, and chromium strong enough to resist an 80 per cent. solution of phosphoric acid.

Fine Chemicals

Merck Dedicates

"To a better world and new courage." To this purpose George W. Merck, president of Merck & Co., dedicated new $200,000 Rahway research laboratories on April 25 in the presence of a distinguished group of drug and chemical executives. "Our investment is still an empty shell whose real purpose in the realm of pharmaceutical research awaits fulfillment in the hands of men."

Lammot du Pont, E. I. du Pont de Nemours president and president of the M. C. A., called by Mr. Merck "titular head of the chemical industry in America," said that only a small part of chemical research effort is visible to the every day man. He classified research in three divisions. 1. Improving the product. 2. Marketing a product never seen before. 3. Products never seen on the market. Choosing nitrocellulose lacquers as an example of the last, Mr. du Pont said that this was the work that had actually increased in large volume in recent years and which called for the greatest expenditure.

Principal speaker was Sir Henry Dale* of England, world famous pharmacologist. "If necessity is the mother of invention, then the spirit of investigation is its father. In this laboratory you are free to choose your problems without being bound by the conditions of a personal endowment, as laudible as that may be." Sir Henry urged unrestricted freedom in the furtherance of research and deplored a general use of patents if these tend to hinder progress. He pointed out that some of the greatest discoveries of untold blessing to mankind had come from laboratories supported by industrial enterprise; that this fact should be ever before the eyes of those who worked at the Merck Laboratory benches.

New Bromine Process

Italian trade publications report development of new process in Italy for recovery of bromine which is said to represent considerable advance over methods now in use. Two chemists of the Institute of Industrial Chemistry, Bologna, C. Ficai and C. Luzzatti, worked out the idea, which has operated with success and met with approval.

Bromine is liberated by chlorine and, unlike usual procedure, is distilled off under vacuum, the vacuum being continued during the various phases of water and chlorine removal from the bromine, which is then converted into iron bromide. Final product is said to be purer and the operating costs commensurately lower than with previous methods.

*See roto section this issue.

W. Russell Howe, 150 William st., N. Y. City, has been appointed agent in U. S. by J. W. Cumming & Son of Liverpool for sale of Irish moss and for gum L. L. Gum is a moss preparation used by textile and leather trades, being imported into this country under the name of "non-edible vegetable gum" and "non-edible seaweed extract."

Monsanto Wins

Error of the Assistant Attorney-General in omitting to sign his name to a protest of reappraisement of a shipment of orthocresol imported from Germany by Monsanto lost case for government in U. S. Court of Customs and Patent Appeals on April 17. Court upheld decision of customs court that appeal was not properly before it. Government had sought review by customs court of decision of a single judge upholding company's protest against appraisement, and papers were in proper order except for signature.

DuPont's aromatic and fine chemical division has been transferred from 260 W. Broadway to 61 Thomas st., N. Y. City. Office is in charge of W. L. Pillet. Arthur W. Mudge, former manager has started a business of his own in Mamaroneck, N. Y.

American Chemical Products, Rochester, N. Y., is producing benzidine C. P., hydrochloride and sulfate in dry and white crystals; methyl orange, methyl red, nitroso-beta, naphthol, lacmoid, sulfanilic acid, phenyl hydrazine, white crystals, base C. P. and base technical.

Tariff Commission has just released "Analysis of Imports for Consumption of Certain Chemicals and Similar Products" not specially provided for "in the Tariff Act of 1930."

New York Quinine's baseball team defeated Mallinckrodt April 22, 11 to 4. N. Y. Q. is open to engagements.

Chas Pfizer & Co., have completed May price list. One advance and two declines are shown. George Anderson and A. A. Teeter returned from Europe at the end of April.

Textile Chemicals

The New Dyes

DuPont Dyestuffs Division has developed Pontamine Diazo Green GW, a dyestuff which when diazotized and developed with Pontamine Developer ZN, produces very brilliant shades of yellowish green. Color is recommended for use on cotton, rayon and pure silk. It is expected that Pontamine Diazo Green GW will find extensive use for application to cotton-rayon mixed goods due to its unusual property of dyeing an excellent union on these fibers in full shades at temperatures near the boil.

Sandoz New Shades

Sandoz Chemical Co., Ltd., has marketed new brown dye Alizarene Light Brown BL, for which patent has been applied for. New color possesses properties that are outstanding; it can be dyed either as an acid color or as a chrome color and is specially recommended for dyeing of slubbing and loose wool. It gives a bright shade of brown which possesses excellent all-round fastness. Fastness to light, carbonizing, stoving, chlorinating, Keymo finish and milling are all very good. Also it is not affected by heat or metals. By use of the Alizarine Light Brown BL, it is claimed, it will be possible to obtain a degree of fastness that has hitherto not been obtainable. When used as a chrome color in conjunction with Omega Chrome Black Blue G, Omega Flavine CLG and Omega Chrome Red G, it will be possible to obtain a range of shade which will meet highest demands of the trade.

William Taylor Stearns, well known bleaching expert, has become associated with Wecoline Products, 282 Portland st., Cambridge, Mass. New company will manufacture special chemical products for almost every branch of the textile industry. Mr. Stearns will be in charge of sales, while William Nelson will be in charge of manufacturing.

Titan Chemical Products, Inc., Jersey City, N. J., will establish sales office for entire Southern territory at Charlotte, N. C. Robert T. Grant has been designated as sales manager for Charlotte office. Also R & H Chemicals Dept. of du Pont has opened Charlotte offices in charge of R. M. Levy at 300 W. 1st st., to handle Southern territory.

Thirty-six new woolen shades, first of Fall color collections presented by Textile Color Card Association, have just been sent to all members in advance swatch form by Margaret Hayden Rorke, managing director.

Summarized

United Piece Dye opened April 10 Hawthorne mill after being closed for a year . . . Charles J. Fagan is now in

charge of dyeing at Lebanon Woolen, Lebanon, N. H . . . Julius Gyllensvard has become overseer of dyeing at Globe Mills of American Woolen, Utica, N. Y. . . . Union Bleachery's employees (Charlotte, N. C.) passed resolution opposing Black 30-hour bill . . . W. H. Furness, president, was appointed receiver for Furness Corp., Gloucester, N. J., manufacturers of cupraammonium rayon yarns, by U. S. District Court, Camden, N. J. on April 23 in action filed by Edward G. Budd Co . . . N. Y. Section, American Association of Textile Chemists and Colorists, heard Allen Rogers of Pratt on "Odd Things in Leather," and Henry Green of Hathorne & Green, N. Y. City, on "Delustered and Pigmented Rayons" at April meeting . . . Nashua (N. H.) Mfg. Co. has virtually completed sale of Great Falls Bleachery & Dye Works at Somersworth to H. O. Jackson, master mechanic at the plant. Famous old bleachery and dye works will be owned by the men who have been operating it for many years . . . John H. Grady, Boston manager for John Campbell & Co., and president, Phi Psi Fraternity will preside at 30th annual meeting at Pinewald, N. J. . . . Herbert R. Mauersberger, formerly of Cox, Fuller & Mauersberger and more recently with Celanese Corp., has opened offices as textile consultant at, 305 Washington st., Brooklyn, N. Y. . . Annual convention of Southern Textile Association will be held in Charlotte, May 26-27 at the Charlotte Hotel. Convention will celebrate 25th anniversary of founding of the association, in Charlotte in 1908.

Textile Colorists Meet

H. C. Copithorne of Somerville, Mass., was elected president of National Association of Textile Printers and Colorists at its annual meeting held last month at Paterson, N. J. Other officers elected: Edward Farnsworth of Appanaug, R. I., first vice-president; Edward Roegner of Delawanna, N. J., 2nd vice-president; Howard Revell of Glasgow, Conn., 3rd vice-president; William Custer of South Manchester, Conn., 4th vice-president; Clarence Hoppe of Oriental Silk Printing, Haledon, 5th vice-president; William Dickinson, National Silk Dyeing, Paterson, 6th vice-president; Leon Wheeler of Jewett, Conn., treasurer, and Frederick L. Babcock of Cambridge, Mass., executive secretary.

Fred Dipianna of Stein-Hall spoke on problems and perplexities of printing and finishing trade. Other speakers were Gerald J. Desmond and Fred Hinkel of Jacques Wolff, Albert Royce of Royce Chemical and Walter Deubel of Providence, R. I. Next meeting will be held in Providence, July 15.

John J. O'Day has joined Darpro Chemical (Textile specialties) N. Y. City as demonstrator and salesman.

Paints, Lacquers and Varnish

Lacquer Patent Appeal

Oral arguments in appeal of lacquer patent suit brought by du Pont against Glidden will be heard in U. S. Circuit Court of Appeals for the Second District, N. Y., either during third week of May before Justice Chase, A. N. Hand, and L. Hand, or during first week of June before Justices Chase, Manton, and Swann. Suit was won in the lower court by Glidden. (CHEMICAL MARKETS, Dec. 1932, p. 539; also July, 1932, p. 53.)

Pittsburgh 1932 Sales

Pittsburg Plate Glass annual report states in part: "Domestic plate glass consumption was the lowest since 1912, despite development of the closed automobile since then. Present outlook does not justify prediction of increased volume; very little can be expected from new building and automobile production is uncertain.

"Gallon sales of company's major paint, varnish and lacquer lines decreased at a rate much lower than that reported for the paint and varnish industry of the country. The industrial and metropolitan areas, particularly those on the Atlantic seaboard, consumed a larger gallonage of the company's products than in any of the past five years. Obsolete colors and finishes were discontinued; new and attractive shades added.

E. C. Roberts has resigned as Detroit Graphite sales manager. Norman W. Drescher, who, in addition to his duties as vice-president in charge of sales of Valentine & Co., has held a similar position in Detroit Graphite, will now assume active direction of all Detroit Graphite sales activities.

Unofficial estimates place exports of casein from Argentina at 17,668,766 kilos in 1932, indicating an increase of 22 per cent. in comparison with the 1931 total of 14,454, 752 kilos. There were no imports in 1932 to Russia, which took 1,120,696 kilos in 1931. Destinations of larger shipments in 1932:

	Kilos
Germany	9,685,344
United Kingdom	2,094,751
Netherlands	1,167,110
Japan	1,146,210
Finland	773,800
Sweden	663,910
Spain	657,075
United States*	318,780
Belgium	214,350
Lithuania	125,220
Norway	77,240

*Exports to the United States in 1931 amounted to 1,352,910 kilos.

Zinc Institute Elects

Ralph M. Roosevelt, Eagle-Picher Lead was re-elected president of American Zinc Institute at annual convention April 18. H. S. Wardner, N. J. Zinc was elected vice-president to succeed late A. P. Cobb, of the same company. All other officers were re-elected including Vice-presidents, J. O. Elton,* International Smelting, Salt Lake City, and John A. Robinson, Commerce Mining & Royalty, Miami, Okla.; treasurer, Howard I. Young, American Zinc, Lead & Smelting and secretary, Julian D. Conover.

Federal Trade Commission stipulation 975—"Lead and Zinc" as a designation or label for a paint pigment in paste form manufactured by a corporation, will no longer be used so as to erroneously imply that the pigment is composed of zinc oxide and sulfate of lead or carbonate of lead in approximately equal proportions of 50 per cent. by weight of the product.

Adolphe Hurst & Co., shellac importers, moved to McGraw-Hill Bldg., 330 W. 42nd st., N. Y. City.

*1933 Douglas Medalist, highest metallurgical award.

Paint, Varnish and Lacquer Sales: February

Sales of paint, varnish and lacquer products in February totaled $12,348,480 in value, according to preliminary report by U. S. Bureau of Census from data supplied by 588 establishments. This compared with $11,949,950 in January and $16,270,822 in February last year. A record of sales in February, compared with revised figures for January and sales by months during 1932, follow:—

		Classified sales reported by 344 establishments				
		Industrial sales			*Trade sales of*	
	Total sales reported by		*Paint and*		*paint, varnish*	*Unclassified sales reported by*
1933	*588 establishments*	*Total*	*varnish*	*Lacquer*	*lacquer*	*244 establishments*
January*	$11,949,950	$3,529,916	$2,386,977	$1,142,939	$4,172,580	$4,247,454
February†	12,348,480	3,419,755	2,440,896	978,859	4,775,416	4,153,309
1932						
January	15,894,506					
February	16,270,822					
March	19,089,005		Comparable statistics not available.			
April	22,612,193					
May	24,981,441					
June	19,637,358	4,685,399	3,617,719	1,067,680	8,734,330	6,217,629
July	14,430,122	3,793,245	2,900,707	892,538	6,058,813	4,578,064
August	16,032,441	3,851,028	3,057,096	793,932	6,918,659	5,262,754
September	16,805,712	3,980,564	3,113,303	867,261	7,216,748	5,608,400
October	15,592,377	3,996,500	3,036,323	960,177	6,610,011	4,985,866
November	13,260,328	3,599,319	2,639,362	959,957	5,196,766	4,464,243
December	10,127,780	3,222,770	2,186,706	1,036,064	3,506,715	3,398,295
Totals, year	$204,734,085	.....	.....	.....	.....	.....

*Revised. †Preliminary.

Exports of crude and ground red oxide of iron from Malaga, Spain, to U. S. in 1932 compared with those in 1931 as follows:

	1932		1931	
	Pounds	*Value*	*Pounds*	*Value*
Iron oxide—				
crude....	606,220	$2,448	681,883	2,765
ground...	5,824,505	52,234	7,879,170	87,036

Paint Sales

Data reported to Dept. of Commerce by 36 identical manufacturers indicated that total sales of plastic paints, cold water paints and calcimines during February attained value of $222,900, as compared with $202,807 for same month last year, and with $297,338 for period in 1931. January, 1933, sales amounted to $171,640. Much better sales of plastic paints accounted for gain over February a year ago, these amounting to 693,611 lbs., valued at $104,106, as compared with 471,740 lbs., worth only $51,673. Calcimine sales were 1,828,311 lbs., with a value of $76,428, as against 2,107,840 lbs., worth $94,199, while sales of cold water paint in dry form attained a total of 743,691 lbs., worth $42,320, as compared with 895,389 lbs. having value of $56,935.

Varnish Substitute

A water emulsion of crude wool-fat, useful as a substitute for varnish and varnish colors, is made by emulsifying wool-fat with an ammonium salt of an aliphatic acid containing at least 10 carbon atoms in the molecule, together with a resin. According to examples, crude wool-fat is emulsified with (1) tall oil, colophony and ammonia, alcohol and water being added to make up the emulsion; (2) tall oil, colophony, nigrosin oleate, ammonia, alcohol, and water; (3) casein, colophony, copal, ammonia, methanol, and water; the emulsions (1) and (3) are mixed with a suitable pigment color, mineral color or lake, iron oxide being specified, to give paints; the emulsion (1) on mixing with chromic oxide, titanium white and turpentine substitute containing a cobalt-lead manganese drier, gives a quickly drying paint.

Albert Burke, 200 Cherry st., Buffalo, will manufacture waterproofing compounds.

Formerly an important buyer of Kauri gum, U. S. took practically nothing during 1932. New Zealand's shipments for the year were 2,078 tons, against 3,019 tons in 1931 and 3,653 tons during 1930.

In Brief

Charles W. Ryans, sales manager for Strassel Gans Paint, Louisville, is a candidate for mayor of Louisville, on the Republican ticket. . . Frank A. Roche, of Wadsworth, Howland, paint manufacturer, Boston, has been elected a director of the Boston Credit Men's Association for three years . . . Dr. G. A. Goodell, vice-president of Kentucky Color & Chemical delivered a talk April 21, before the Kentucky Chemistry Teachers' Association, division of the Kentucky Educational Association subject: "Manufacturing Dry Colors."

"The Big Paint News of 1933" and "Property Inspection Service" appear in latest issue of *Dutch Boy Painter and Carter Times*, published by National Lead.

Personnel Changes

Joseph Esposito, president, Ault & Wiborg Varnish, succeeds Eugene E. Andrews as a director of National Printing Ink.

McCloskey Varnish, Philadelphia, has appointed Edward O'Connor to San Francisco sales division, and William M. Burns and Earl S. Opdyke to Philadelphia sales division.

William J. Harris, vice-president and general manager North Bergen Varnish, and A. A. Morse, in charge of company publicity, have severed connections with the company.

Deaths

Herman Uehlinger, 52, president, Egan & Hausman Co., Long Island City, N. Y., paint manufacturer, died suddenly, April 16 of a heart attack. He started in 1885 as office boy for Hilo Varnish and when he resigned in 1930 he had risen to a vice-presidency.

Dr. Isaac Wyman Drummond, 78, retired chairman of the board of Devoe & Raynolds and noted paint chemist, died April 15 at his home in N. Y. City. He was a son of James F. Drummond, a founder of Devoe & Raynolds.

Linseed oil consumption declined nearly 50 per cent. in 1932.

Naval Stores

Foreign Shipments in March

Foreign shipments of naval stores for the month of March totalled 8,074 barrels spirits of turpentine and 77,456 barrels rosin. In spirits turpentine there was a falling off for the past 12 months of 28,851 barrels, or nearly 12 per cent., while in rosins foreign movement showed a decrease of but 30,445 barrels, or a falling off of less than three per cent. Exports for the past 10 naval stores years are reported by *Savannah Weekly Naval Stores Review* as follows:

Year	*Bbls. Turpentine of 50 gals.*	*Bbls. Rosin of 500 lbs.*
1932-33	225,056	1,089,249
1931-32	253,907	1,119,694
1930-31	327,312	1,219,388
1929-30	338,812	1,365,807
1928-29	275,926	1,278,813
1927-28	329,910	1,373,006
1926-27	255,879	1,129,614
1925-26	227,230	1,083,131
1924-25	249,703	1,463,168
1923-24	224,568	1,170,160

The averages of exports for the four previous years, 1927-28 to 1931-32, were 305,173 barrels spirits turpentine and 1,271,341 barrels rosin. Exports for 1932-33 accordingly showed decreases compared with the previous five years averages of 80,117 barrels spirits turpentine, or over 16 per cent.; and 182,092 barrels rosin, or 14 per cent.

On May 1st, Savannah and Jacksonville Naval Stores Sections began to meet for trading at 12.00 noon instead of 1.00 P. M., E. S. T. This change is being made to conform with daylight saving time in vogue in the North and West. Usual trading hour of 1.00 P. M. will be resumed at the close of the summer.

March production of naval stores by steam distillation and solvent treatment of wood and stocks of these products on hand March 31, according to data collected by producers' committee, through Arthur Langmeier, of Hercules Powder, secretary, were as follows:

Production

	Rosin 500-lb. barrels	Turpentine bbls. 50 gallons	Pine oil Gallons
Month of Mar.	**26,597**	**4,255**	**202,929**
Total from April 1, 1932	**355,923**	**58,293**	**2,397,716**

Stocks at Plants

Total Mar. 31, 1933	**98,615**	**12,387**	.....
Mar. 31, 1932	**90,540**	**5,835**	.....
Change	**+8,275**	**+6,552**	.....

Note—Rosin production and stocks include all grades of wood rosin.

Movement is started to consolidate naval stores yards at Savannah, Hutchinson's Island and concentrating on the mainland at the A. C. L. yards. Special committee has been appointed to go into this matter and report back to the Naval Stores Section. Committee: Chairman Thorpe, Messrs. Mackall, Nash, Kayton, McIntosh, and Traffic Manager Gaines. The inconveniences and additional expense incurred by the island yard prompts the movement to consolidate.

Naval Stores Section, Savannah Chamber of Commerce passed resolutions, April 21 extolling the work of the late Irving Post in behalf of the naval stores industry.

Mexican Naval Stores

Activities of Mexican naval stores industry in February were confined to preparations for new season. Present plans call for forming of approximately 70 crops of cups with five stills active. Shipments of naval stores from Durango for February, 1933, were 24,000 gallons of turpentine sent to U. S. and 65 metric tons of rosin for domestic consumption. Stocks on hand at the end of February were reported less than 8,000 gallons of turpentine and 1,000 metric tons of rosin.

A. Oettler of Whitney & Oettler, N. Y. City naval stores dealers, is in Savannah. Mr. Whitney of the same firm recently returned from a European trip.

At annual election of Savannah Board of Trade, naval stores section, Capt. George W. Drummon, assistant secretary of Consolidated Naval Stores, was elected chairman. Porter Mackall Antwerp Naval Stores, was elected vice-president.

Charles L. Read, president Charles L. Read, N. Y. City naval stores dealer, was in the naval stores belt in April.

Hercules New Booklets

Naval Stores Dept. of Hercules is distributing series of folders describing properties of Yarmor Steam-distilled Pine Oil. Because of its detergent, solvent, disinfectant, and deodorant properties, Yarmor Pine Oil has been found to be of especial interest to manufacturers of disinfectants, insecticides, cattle sprays, liquid hand soaps, liquid scrubbing soaps, and metal polishes. Folders will point out the high content of active ingredients in Yarmor as contrasted with other pine oils and will also outline emulsifying and dispersing properties of Hercules product.

New turpentine distillation plant, partly constructed on Government specifications, was put into service last month by Walter Williams at Du Pont, Ga.

Naval stores stocks in Portugal at the end of February were estimated at 283,371 gallons of turpentine and 100 metric tons of rosin. There is still available a small stock of crude gum for distillation. Total exports for February were 80,786 gallons of turpentine and 387 barrels of rosin.

Recent tests run at the new Naval Stores Station, Florida, show that rosin of WG (window glass) grade and better can be made from straight scrape even from high faces. Usually it is customary for operators to make around K grade from scrape with or without some rusty dip.

Turpentine imports into Sao Paulo, Brazil, decreased from 270,776 gallons in 1930 to 241,810 gallons in 1931.

Oils and Fats

Markets in April

The declines in vegetable, animal and fish oils over the period of the past three years have been more severe, perhaps, than in any other division of the chemical and allied industries. It was only quite natural, therefore, when the long-awaited reaction finally set in that prices should rebound with greater suddenness and to greater heights. With so many of the more important oils imported, abandonment of the gold standard and consequent reduction in purchasing power of the dollar abroad, immediately brought about a raising of the general price structure. Hesitancy of primary market factors over the immediate trend of the dollar resulted in most cases in very light offerings, and quotations were largely nominal. Business was more active and buyers, in several instances, were soliciting contracts after holding tenaciously to hand-to-mouth buying policies for months. Domestic producers and importers alike are more optimistic about future business.

Linseed oil prices have advanced to new high levels for 1932. Flaxseed was much stronger. Volume of business in oil was better than in March, and the outlook for prices remaining fairly firm were considered bright. There was 22 mills in U. S. which crushed flaxseed during quarter ending March 31, reporting a crush of 122,178 tons of flaxseed and a production of 79,563,929 lbs. of linseed oil according to preliminary figures of the Bureau of the Census. These figures compare with 151,007 tons of seed crushed and 99,783,339 lbs. of oil produced for the corresponding quarter in 1932; 183,980 tons of seed and 118,417,218 lbs. of oil in 1931; 223,036 tons of seed and 145,969,802 lbs. of oil in 1930; 303,503 tons of seed and 202,353,031 lbs. of oil in 1929; and 332,777 tons of seed and 223,750,569 lbs. of oil in 1928. Stocks of flaxseed at the mills March 31, amounted to 46,101 tons compared with 42,082 tons for the same date in 1932.

Sustained improvement both in demand and in price featured the chinawood oil market. Inquiries were in greater number, and importers feel that now it is decidedly less of a buyer's market, and that the immediate trend of prices will be firmer.

Indicted

Indictment charging violation of Elkins Act relative to soliciting and receiving concessions lower than published tariffs on rail shipments was returned by Federal grand jury at New Orleans April 16, against Southern Cotton Oil Gretna, La. It is charged company shipped cottonseed meal cake in carload lots from West Monroe, La., to its Gretna plant under domestic rate schedules when export rate schedules should have applied. Freight rate under domestic shipment is 15c per 100 lbs., whereas the export rate is 24c per 100 lbs.

Allied Mills, Inc., is erecting soy bean mill (600,000 bushels annual capacity) at Southgate Industrial Terminal, Eastern Virginia. Storage facilities for 150,000 gal. of oil will be available.

Oleo oil reclassified April 14 by Cuba as oleomargarine instead of refined tallow carries new rate of $40 per 100 kilos, but exempt from surtax, with tare allowance of 12 per cent. of gross weight when packed in ordinary boxes, tierces or cans, and 35 per cent. of gross weight when packed in other containers of wood, glass or tin. In addition, both imported and domestic oleo oil will be subject to consumption tax of $3 per 100 kilos.

Menhaden Sales

Sales of 10 tanks of crude menhaden oil in the last week of April at 10c a gal., f. o. b. Baltimore, reduced stocks on hand in Chesapeake Bay section approximately to 60 tanks, which is the lowest for the past several years. Pressers are taking hold more freely than for several seasons and outlook for opening of the 1933 season in June is more encouraging. Very little herring oil was made in the Chesapeake Bay this season, which closed May 1 and is being carried over for the menhaden season.

Nova Scotia Sea Foods, Inc., has established large new plant at Canso, N. S., for processing fish meal and fish scrap. Company has opened N. Y. City offices.

Shipments of Chinese tung oil to U. S. aggregated 80,646,000 pounds for 1932, compared with 72,072,000 pounds during 1931. Exports to all countries were 106,780,400 pounds in 1932, as contrasted with 94,266,000 pounds in 1931.

Menhaden and whale oil refiners have adopted practice of quoting prices on pound basis against customary gallon basis. New method of quoting 7½ lbs., to the gallon, same as linseed oil, is expected to make for greater accuracy.

Charles T. Harriott, former construction engineer for Swan, Finch, died April 23. He retired from active duty in 1921.

H. W. Pierce, Salem Oil & Grease, is back from trip to western tanning centers.

Coal Tar Chemicals

A Far-reaching Decision

U. S. Court of Customs and Patent Appeals April 17 in a far-reaching decision ruled in case brought by General Dyestuff that the standard of strength of dyes mentioned in coaltar dyestuffs paragraph of the Tariff Act refers to color and not content of pure dye.

Company imported alizarin direct blue RXO, which was assessed at 7c per pound, plus 45 per cent. on double weight of actual importation, on the ground that it had twice tinctorial strength of cyanthrol R, another dye which Treasury Department had set up as standard of strength for the imported dye. Importer argued that department had failed to set up a standard for its dye, that it was not a standard to compare it with another manufacturer's dye, and that standard attempted to be used was a standard of color which does not constitute a standard of strength. General Dyestuff argued that pure dye content of the merchandise is the true standard of strength.

Court held that there was no proof that Treasury Department was not conforming to trade usage and custom in accepting tinctorial strength as standard for a dye. Court reported it could not agree that a standard must be something which may be expressed numerically, as dyes of known tinctorial strength are capable of being used as standards, pointing out that, while no standard was set up for cyanthrol R, its formula and color were well known to the trade and were described fully in scientific works and the "Colour Index." Decision declared that it was not the intent of Congress that there be a separate standard of strength for each of the several thousand trade names of dyes in use.

1931 Census Figures

Preliminary figures of the Bureau of the Census as to the by-products output of the manufactured gas industry in U. S. in 1931 show a total production of 190,451,802 gallons of tar, which compared with 209,408,472 gallons in 1929, the last preceding census year. Output of ammonia products included a total of 37,852,903 pounds of ammonia (NH_3) content, as against 36,216,150 pounds in 1929. Comparative figures of quantities and values of these and other products are presented in the following table:—

By-Products Output of Manufactured Gas Industry

	1931	*1929*
Tar—		
Total prod. gals	190,451,802	209,694,472
For sale—		
Gallons	149,891,320	163,694,890
Value	$6,631,144	$8,169,807
Water-gas tar—		
Gallons	59,747,486	74,466,951
Value	$2,305,970	$3,266,381
Coal-gas tar—		
Gallons	89,201,614	88,149,260
Value	$4,253,640	$4,816,008
Oil-gas tar—		
Gallons	942,220	1,078,679
Value	$71,534	$87,418
Consumed in plants gallons	40,560,482	45,713,582
Ammonia products—		
Total ammonia (NH_3) content—		
Pounds	37,852,903	36,216,150
Value	$1,720,916	$2,173,491
Reported as—		
Ammonium sulfate (for sale)—		
Pounds	112,718,691	92,826,531
Value	$1,455,815	$1,727,540
Ammonia (NH_3) for sale)—		
Pounds	9,673,231	13,009,518
Value	$265,101	$445,951
Crude light oil—		
Total prod., gals	6,884,489	5,272,006
For sale—		
Gallons	3,924,621	505,954
Value	$289,072	$40,294
Plant consumption and loss, gallons	2,959,868	4,766,052
Light-oil derivatives—		
Total prod. gals	4,880,764	9,270,077
For sale—		
Galons	3,142,022	4,414,324
Value	$488,219	$944,628
Plant consumption and loss, gals	1,738,742	4,855,753
Drip and holder oil—		
For sale—		
Gallons	3,499,218	4,746,977
Value	$242,836	$375,896
Naphthalene, crude—		
Total prod., lbs	1,017,005	3,063,738
For sale—		
Pounds	775,885	2,995,121
Value	$11,502	$50,529
Plant consumption and loss, pounds	241,120	68,617
Other by-products of gas mfr., value	$1,336,686	$1,967,980

Chinese Dye Imports

Chinese imports of aniline dyes and artificial indigo dropped radically during 1932. Sulfur black, however, was the only coal tar dye to show any increase in imports, thus emphasizing a trend toward these dyes which has been evident during the past year.

Germany remained leading supplier of aniline dyes, accounting for total value of 3,422,456 gold units, compared to 4,525,838 gold units in 1931 and also for a value in 1932 of 2,013,191 gold units of artificial indigo and 1,920,609 gold units of sulfur black. U. S. ranked second, supplying 797,757 gold units of aniline dyes, 1,138,348 of the indigo and 642,687 of sulfur black.

U. S. Import Statistics

U. S. imports of synthetic dyes in March totaled 267,890 lbs., valued at $257,626. This total compares with 482,545 lbs., valued at $410,865, imported in March, 1932. Imports of synthetic aromatics in March were smaller than those in March, 1932. Imports of color lakes were also smaller this year; but imports of other fine coaltar products were larger in volume, totaling 177,781 lbs., valued at $52,090, compared with 87,479 lbs., valued at $63,690, imported in March, 1932.

Imports of Synthetic Dyes

	1933		*1932*	
	Lbs.	*Value*	*Lbs.*	*Value*
January	314,878	$311,640	297,266	$259,558
February	365,144	369,829	429,298	367,154
March	267,890	257,626	482,545	410,865
Totals	947,912	$939,095	$1,209,109	$1,037,577

Countries of Origin

	Percentages—March	
	1933	*1932*
Germany	56.73	71.76
Switzerland	40.60	25.35
England	2.51	1.58
All other	.16	1.31

Leading Dyes in March Imports

	Pounds
Vat golden yellow GK double paste (single strength)	34,000
Ciba brown G paste	9,083
Indigosol 04B	6,173
Vat printing black B paste	5,500
Vat khaki GG paste	5,250

Imports of Aromatic Chemicals

	Lbs.	*Value*	*Lbs.*	*Value*
	1933		*1932*	
January	2,744	$4,060	2,410	$2,851
February	3,153	2,899	7,006	20,520
March	6,346	11,288	8,632	17,849
Totals	12,243	$18,247	18,048	$41,220

Imports of Medicinals, Photographic Developers, Intermediates, and Other Coaltar Products

	1933		*1932*	
	Lbs.	*Value*	*Lbs.*	*Value*
January	55,087	$40,480	38,622	$26,401
February	137,144	97,944	108,219	80,715
March	177,781	52,090	87,479	63,690
Totals	370,012	$190,514	234,320	$170,806

Leading Items in March Imports

	Pounds
Cresylic acid	105,404
Diazo salt G	6,032
Parachlorometacresol	5,049
Fast red KB base	4,500
Methylanone, pure	4,491
Aminobenzolsulfonyl compound of benzidin sulfonate (ammonium salt)	3,128
Protectol	3,003

Imports of Color Lakes

	Pounds	
	1933	*1932*
January	391	1,090
February	10	842
March	1,834	2,707
Totals	2,235	4,639

SOURCES OF WORLD DYE SUPPLY—BY EXPORTING COUNTRIES

Millions of Pounds

	1913	1920	1923	1926	1929	1930	1931
Total Exports From—Germany	240.1	61.5	73.9	81.9	94.7	91.5	96.4
United States	....	(1)	17.9	25.8	34.1	28.3	20.3
Switzerland	19.5	23.8	18.3	17.3	21.9	18.0	18.5
U. Kingdom	5.5	13.8	9.2	6.0	15.2	10.2	11.9
France	1.2	7.2	5.0	8.8	5.8	4.6	6.7
Japan	....	....	2.3	1.0	1.8	4.6	4.5
Other	0.1	[1]0.8	1.5	2.6	2.1	2.4	2.0
Total	266.4	107.1	128.1	143.4	175.6	159.6	160.3

[1]Exclusive of U. S. exports for which no quantity figures are available.

Above statistics from recent report of C. C. Concannon, Chief, Chemical Section, Bureau of Foreign & Domestic Commerce.

Fertilizers

Foreign Consolidations

French fertilizer concerns have effected merger uniting Union Espagnole de Fabriques d'Engrais de Produits Chimiques et de Superphosphates, Compagnie Regionale des Engrais du Berry, Compagnie Regionale des Engrais de l'Orleans-Beauce, and Compagnie Regionale des Engrais de Normandie under name of Compagnies Reunies de Fabriques d'Engrais et de Produits Chimiques.

Large phosphate producers in northern Africa are said to be negotiating a merger. Move would combine Compagnie des Phosphates de Constantine, largest producer in Algeria, and Compagnie des Phosphate et du Chemin de Fer de Gafsa, leading producer in Tunisia.

Kuhlmann has acquired a majority shareholding in Societe de Produits Chimiques et Engrais D'Auby, one of the most important firms in French fertilizer business and which possesses plants at Auby, Feuchy and Artres for refining potassium nitrate, manufacture of superphosphate, other artificial fertilizers, and a number of general organic chemical products.

James Hugh Brawner, first vice-president of Southern States Phosphate & Fertilizer, died April 15 at Virginia Beach after a lingering illness. He spent over 25 years in the service of his company.

Palestine Potash reports through economic dept., Jewish Agency, Jerusalem, opening of second bromine plant and expansion of potash production.

Washington Fertilizer, with principal office at Washington, N. C., has filed certificate of incorporation.

Anderson Fertilizer, Anderson, S. C., is running day and night. Plant is turning out 400 tons of goods daily. Other fertilizer companies in this section are also experiencing good business.

American shipments of nitrate, which totaled 22,000 tons, were expanded to a total of 80,000 tons to France during past year, according to figures recently made available, while substantial quantities also were exported by the U. S. in 1932 to Great Britain, Italy, Spain, Holland, Sweden and Japan.

Value of American shipments, consisting mostly of aynthetic nitrate of soda, was $2,910,120, against a value of $904,760 on the 1931 nitrate. In the opinion of French chemical trade, American shipments last year to Europe were near the $4,000,000 mark, the result of only two years' sales efforts. No nitrate to speak of was exported by the U. S. prior to 1931. By contrast, Chilean natural nitrate fared poorly in the French market last year, such shipments amounting to but 41,433 tons, compared with 330,027 tons during 1931.

A. M. Ingram, 65, vice-president and production manager for Cooperative Great Lakes Fertilizer Mills, died suddenly April 8 at his home in Baltimore.

Tidewater Guano Co., Suffolk, Va., has been granted a charter to manufacture fertilizers. Thos. O. Woodward, of Suffolk, is president of the new company. Capital $20,000.

During fiscal year ended July 31, 1932, use of cottonseed meal as fertilizer showed large gain. According to reports received by Bureau of Agricultural Economics, U. S. Dept. of Agriculture and N. F. A., 506,765 tons of meal were used, compared with 259,548 tons for year ended July 31, 1931. Farmers used more than twice as much meal as they used during preceding year figures being 465,380 tons, compared with 191,680 tons for previous year.

Disagree on Phosphate Rates

Phosphate shippers and railroads were unable to reach agreement on shipping rates within the State of Florida and other matters at meeting at Tampa, April 10. Informal discussion was called by Florida State Railroad Commission at request of shippers and carriers who thought problem could be settled without action by commission. It is expected that next steps will be taken by railroad commission. Rate changes that may be made will not affect rates on phosphate shipped from mines to Tampa, principal export port. A. B. Whittemore, Cyanamid general traffic manager, attended.

Order handed down April 24 by North Carolina State Corporation Commission, directed Seaboard Air Line to adjust "unreasonable discrimination" in rates on fertilizer materials from Wilmington to Gibson, Rockingham and Wadesboro, and removal of rates was ordered on or before May 1.

Assails Shoals Plans

E. H. Westlake, Tennessee Corp., vice-president and treasurer, reports "Loss of Tennessee Corp. in 1932 was largely absorbed in reduction of inventory rather than by loss of cash and securities, and company has sufficient current assets to pay all its current liabilities and retire its bonds."

He assailed bitterly government's proposal to enter fertilizer industry, stating "the fertilizer industry has a capacity of around 12,000,000 tons a year, 50 per cent. more than the 1930 peak demand for fertilizer and about three times the 1932 demand."

Belgian superphosphate production increased about 17 per cent. in 1932 to a total of more than 350,000 metric tons. Exports were 218,000 tons, chiefly to France, the Netherlands, the United Kingdom, and Germany.

Cotton seed hulls are used in making expansion joints for hard-surfaced roads in El Paso. Every 80 feet a one and one-half inch strip of the hulls is tamped across the slabs, underlaid and covered with asphalt.

March Fertilizer Tag Sales

	Equivalent tons*							
	March				January-March			
South—	P.C. of 1932	1933	1932	1931	P.C. of 1932	1933	1932	1931
Virginia	155	57,651	37,088	56,467	108	124,019	114,335	179,303
North Carolina	145	199,060	136,883	314,432	130	338,876	261,424	537,815
South Carolina†	127	208,437	163,819	258,289	120	288,675	241,198	357,469
Georgia	134	206,203	153,515	343,612	118	248,398	210,032	514,667
Florida†	86	19,609	22,842	44,786	86	105,514	123,317	154,768
Alabama	112	76,600	68,600	165,350	110	108,750	99,250	239,000
Mississippi	77	20,120	25,967	79,175	80	34,995	43,900	111,425
Tennessee†	101	12,041	11,954	23,719	101	21,493	21,326	43,681
Arkansas‡	119	3,675	3,100	14,685	88	8,475	9,600	31,796
Louisiana†	102	11,667	11,470	29,345	96	23,017	23,854	60,523
Texas	177	7,347	4,148	14,137	91	20,152	22,218	50,522
Oklahoma	29	75	260	815	68	1,825	2,670	6,559
Totals, South	129	822,485	639,646	1,344,812	113	1,324,189	1,173,124	2,287,528
Midwest—								
Indiana	70	10,919	15,537	31,734	73	16,213	22,137	59,390
Illinois	29	1,489	5,081	4,360	44	3,260	7,326	12,771
Kentucky	36	7,837	21,658	20,023	62	19,949	32,355	48,038
Missouri	47	2,290	4,847	8,561	43	4,689	10,860	21,944
Kansas	34	63	185	940	14	173	1,265	1,316
Totals, Midwest	48	22,598	47,308	65,618	60	44,284	73,943	143,459
Grand totals	123	845,083	686,954	1,410,430	110	1,368,473	1,247,067	2,430,987

*Monthly records of fertilizer tags are kept by State control officials and are slightly larger or smaller than the actual sales of fertilizer. The figures indicate the equivalent number of short tons of fertilizer represented by the tax tags purchased and required by law to be attached to each bag of fertilizer sold in the various States.

†Cottonseed meal sold as fertilizer included.

‡Excludes 19,210 tons of cottonseed meal for January-March combined, but no separation is available for the amount of meal used as fertilizer from that used as feed.

The Financial Markets

Allied's Financial Statement

Whether N. Y. Stock Exchange can dictate (for the benefit of stockholders) information given in financial reports of companies whose securities are traded in seems closer to an answer. Stockholders of Allied have fought unsuccessfully for greater details as to the company's business. No statements have ever been given out showing separate earnings of the various units (General Chemical, Solvay, Barrett, National Aniline and Atmospheric Nitrogen). With the rapid depreciation in stock and bond values stockholders want to know just what "United States Government and other marketable securities —$92,404,341—means.

Lively Stockholders' Meeting

At the annual meeting, April 24, James W. Gerard, former U. S. Ambassador to Germany, in an angry mood protested against a "policy of secrecy." Mr. Gerard stated after the meeting: "A stockholder is entitled to such information as I requested. The corporation should not be regarded as a blind pool." "The income account should be itemized," Mr. Gerard said to show the source of the company's income, as well as the charge for depreciation. "Stockholders should be told what proportion of the earnings is from stock market operations and what was derived from manufacturing." It was admitted at the stockholders' meeting that as of Dec. 31 security and government holdings of the company had depreciated $28,000,000; that the cost figure was $92,404,341.

It now appears from correspondence released by the Committee on Stock List of the Exchange that the company's policy has been a matter of sharp controversy, between the Committee and the officers of Allied, particularly H. F. Atherton, secretary, and Orlando Weber, president. It appears from the letters (published completely in the *Wall St. Journal*, April 27) that the Committee in connection with applications for additional stock listings in 1929 requested that the company modify and enlarge its financial statements. At that time the company reported that to do so would be damaging to the corporation in the conduct of its business. On March 22 of this year the Committee advised the company that it had received a complaint from a stockholder; on June 22 further complaints were reported.

After considerable correspondence, in which no mutually satisfactory arrangement was reached, Frank Altschul, secretary of the Committee, announced, April 24, "in view of the foregoing correspondence, and the press statements referred to (Report of the stockholders' meeting), the Committee on Stock List is forced to the conclusion that further discussion with the Corporation will prove unavailing and therefore reports the matter to the Governing Committee for such action as it may deem appropriate in the circumstances."

The Governing Committee immediately advised the Company that it would be given an opportunity to be heard on May 3. On that date the Committee reported to the press that they had postponed action for one week at the request of counsel for the Corporation, in order to prepare arguments.

Allied has been looked upon by Wall Street as a premier American chemical common stock. Should the Committee take the drastic acition of removing the stock from the list in the event the Corporation fails to alter its present attitude, it is uncertain just what security would succeed to Allied's place. The street was particularly interested to learn that the extensive Solvay interests were not voted at the recent meeting and Baron Emmanuel Janssen, their representative, retired from the board and was succeeded by W. C. King, an employee of the company.

Prices Skyrocket

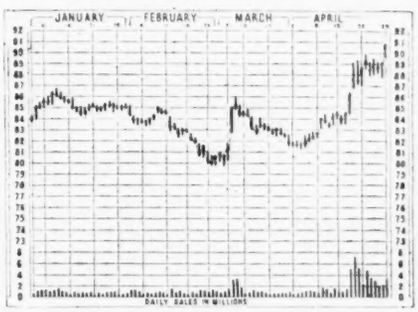
The Stock market staged a violent recovery in April in response to the inflationary legislative program of the administration, abandonment of the gold standard, and signs of definite improvement in business. The advance, in fact, was the sharpest since August, 1929.

Improvement in prices erased all losses of the previous six months and raised the price level to where it was at the beginning of September, 1932.

As measured by appreciation in values of 240 stocks (*N. Y. Times*) 20 of the principal groups listed on the N. Y. Stock Exchange, gain in April was $4,244,262,095, equivalent to 39 per cent. This compared with a gain of $177,172.03, or 1½ per cent., in March, and with a loss of $2,534,657,948, equal to 19 per cent. in April, 1932.

Since the end of September, 1929, market, as measured by movements of stocks in this compilation, advanced in 16 out of 43 months. Values at the end of April were still 70 per cent. below those of three and one-half years ago, although showing an irregular improvement since end of June, 1932, equal to nearly 100 per cent.

Daily Record of Stock Market Trend



—N. Y. Herald Tribune

The advance during the month was sustained with prices reaching higher levels in each succeeding week. Scope or trading embraced all classes of stocks, with volume the largest for a month since last Fall. Industrial issues, especially those in which better business reports came to hand during the month, were heavily traded. Those stocks in which large inventories existed moved up fast in conjunction with a general rise in commodity prices.

Chemical Stocks Soar

To what extent prices were improved last month is shown in some of the gains in values for the 20 groups. Rubber stocks showed greatest advance—115 per cent.—while the least advance—19 per cent.—was scored in the public utilities. Copper stocks advanced 88 per cent., motors 83 per cent. and steels 78 per cent. in values since the end of March. Average gain for the 240 issues was 5.250 points in April, with the issues in the chemical group showing an average gain of 8.833 points, while in the amusement group the average appreciation was 2.250 points.

Price Trend of Chemical Company Stocks

	March 30	*April 8*	*April 15*	*April 22*	*April 29*	*Net Change*
Allied	75½	80¼	85¼	89¾	87½	+ 8
Air Reduction	54½*	57	58¼	61½	61	+ 6½
Anaconda	6½	7⅜	8⅜	10¾	11⅜	+ 4⅞
Columbian Carbon	26¼	29¾	32½	35½	35½	+11¼
Commercial Solvents	12¾	13⅝	14¾	16¼	16⅝	+ 3⅞
DuPont	34	35⅞	40½	43⅛	48¾	+14¾
Mathieson	15½	16⅝	17⅞	18¼	20¼	+ 4¾
Monsanto	29⅜	32½	33¾	35¼	37½	+ 8⅛
Std. of N. J.	25⅜	27⅛	28¾	33⅛	33¾	+ 8⅜
Texas Gulf	17	19	20⅞	23⅜	24	+ 7
U. S. I.	20⅜	23⅛	25	25½	27¼	+ 6⅞

Following table shows the changes in the 20 groups of the *N. Y. Times*.

Group and Number of Issues	*Avr. Net Ch'ge in Points*	*Change in Values*
Amusements (5)	+ 2.250	+ $18,505,817
Building equipment (9)	+ 4.250	+ 65,086,694
Business equipment (4)	+ 5.500	+ 38,937,941
Chain stores (14)	+ 3.348	+ 130,117,268
Chemicals (9)	**+ 8.833**	**+ 403,188,208**
Coppers (15)	+ 8.458	+ 272,968,886
Department stores (10)	+ 4.075	+ 42,319,419
Foods (19)	+ 7.289	+ 329,410,772
Leathers (4)	+ 5.125	+ 7,222,372
Mail order (3)	+ 7.291	+ 85,848,180
Motors (15)	+ 3.417	+ 521,751,584
Motor equipment (7)	+ 2.303	+ 15,190,772
Oils (22)	+ 2.642	+ 686,698,510
Public utilities (29)	+ 3.414	+ 621,762,400
Railroads (25)	+ 6.005	+ 385,137,027
Railroad equipment (8)	+ 6.031	+ 82,084,119
Rubber (6)	+ 5.104	+ 37,030,750
Steels (13)	+ 7.471	+ 261,093,394
Sugars (9)	+ 5.458	+ 35,239,496
Tobaccos (14)	+ 8.143	+ 204,668,486
Average and total 240 issues	+ 5.250	+ $4,244,262,095

As evident from the above statistical data, the chemical group exhibited specially strong tendencies. Outstanding advances were made by Allied, (17½); du Pont (19¼); Carbide (11¾). Changes in values in the nine stocks comprising the chemical group were as follows:

	Advances	*Declines*
Allied Chem. & Dye	$42,022,540	.....
Commercial Solvents	12,018,858	.....
Du Pont de Nemours	213,014,398	.....
Mathieson Alkali Wks.	4,065,225	.....
Texas Gulf Sulphur	19,685,000	.....
Union Carbide & Carbon	108,416,510	.....
U. S. Indus. Alcohol	2,944,021	.....
Virginia Carolina Chem.	180,408	.....
Westvaco Chlorine	841,248	.....
Total	$403,188,208	.....

The net gain of $403,188,208 in April, 1933 compares with a net loss of $345,560, 928 in April, 1932. The net changes from January through April, 1933 have been as follows:

	Increases	*Declines*
January	$39,652,757	.....
February	.....	168,411,582
March	24,037,138	.....
April	403,188,208	.....

The net gain for the first four months of 1933 totals $298,566,527, and aids materially in wiping out the total decline of $368,177,263 for the entire year of 1932.

Trading in Monsanto was particularly heavy during the past month, caused largely by the anticipation of a favorable quarterly statement, and the acquisition of Swann. The controversy between the management of Allied and the Stock Exchange brought about heavy trading and a momentary decline in the price of the common when the correspondence between the officials of the company and the Committee on Listings was published.

Earning statements released during the month generally were of an encouraging nature. Despite the serious disturbance of March, caused by the banking moratorium, many of the statements indicated better business in the first quarter. The outlook for earnings in the 2nd quarter are even brighter.

Solvay American Collateral

Solvay American Investment has notified N. Y. Stock Exchange that it has deposited following collateral to secure 15-year 5% gold notes series A, due 1942; 380,778 common shares of Allied Chemical 10,200 shares of American International, 3,200 shares of Chase National, 642 shares of Guaranty Trust, 100 shares of First National Bank of N. Y. and $1,150,000 principal amount of Solvay American Investment Corporation 5% gold notes, series A, due 1942.

Dividends and Dates

Name	*Div.*	*Stock Record*	*Payable*
Allied Chemical	$1.50	Apr. 11	May 1
Amer. Home Prods.	.25	Apr. 14	May 1
Amer. Home Prods.	.25	May 15	June 1
Archer-Daniels, Mid.	.25	May 20	June 1
Archer, Daniels, pf	$1.75	Apr. 20	May 1
Atlas Powder, pf	$1.50	Apr. 20	May 1
Cons. Chem. Ind. pt. pf A	.37½	Apr. 15	May 1
Dow Chemical	.50	May 1	May 15
Dow Chemical, pf	$1.75	May 1	May 15
Freeport Texas	.50	May 15	June 1
Freeport Texas, new 6% pf. ini	$1.50	Apr. 14	May 1
Hercules Powder pf	$1.75	May 4	May 15
Int. Nickel, pf	$1.75	Apr. 1	May 1
Int. Print. Ink, pf	$1.50	Apr. 15	May 1
Lehn & Fink	.50	May 15	June 1
Nat. Lead pf A	$1.75	June 2	June 15
Nat. Lead pf B	$1.50	Apr. 21	May 1
N. J. Zinc	.50	Apr. 20	May 10
Owens-Ill. Glass	.50	Apr. 29	May 15
Owens-Illinois, pf	$1.50	June 15	July 1
Proctor & Gamble	.37½	Apr. 25	May 15
Shawinigan W & P	.12	Apr. 21	May 15
Sherwin Williams, pf A	$1.50	May 15	June 1
Solvay Amer. Invest. pf B	$1.37½	Apr. 15	May 15
Vulcan Detinning, pf	$1.75	July 7	July 20

BDividend will be paid only if preferred stock is not impaired on payable date.

Over the Counter Prices

	March 31		April 30	
J. T. Baker	..	..	..	..
Dixon	24	17	20	30
Merck, pfd	75	79	80	85
Worcester Salt	..	..	40	50
Young, J. S., pfd	75	81	77	82
Young, J. S., com	35	50	36	50

Foreign Markets

London	**March 31**	**April 30**
British Celanese	6s 6d	7s 9d
Celanese	35s	53s 9d
Courtaulds	£1¼	£1⅜
Distillers	53s 9d	53s 7½d
Imperial Chemical	25s 3d	24s 4½d
Un. Molasses	5s 9d	5s
Paris		
Kuhlmann	580	530
L'Air Liquide	880	760
Berlin		
I. G. Farben		149
Milan		
Italgas		12¾
Montecatini		104½
Snia Viscosa		177

N. Y. Curb Exchange Committee on Listing has suspended dealing in voting trust certificates for common of Silica Gel.

Merck Elects

Merck directors April 19 anticipated 1st mortgage bonds of Merck & Co. Inc., to the extent of $300,000., thus eliminating total outstanding bonded indebtedness. Original 1st Mortgage 6% Serial Gold Bonds authorized and issued in 1927 amounted to $2,700,000, and final maturity date was 1936. Following officers were elected: Chairman of the Board, Frederic Rosengarten; President, George W. Merck; Vice-President and Treasurer, George W. Perkins; Vice-Presidents, J. H. Ambler, R. E. Gruber, James J. Kerrigan, Joseph Rosin; Secretary, Oscar R. Ewing; Assistant Secretaries, P. McK. Garrison, S. W. Walker, H. R. Neilson; Assistant Treasurer, H. Stein.

At the request of Joseph G. Rosengarten, Jr. his resignation as vice-president was regretfully accepted by the Board.

Curb announced April 13, removal from list of no-par common stock of Anglo-Chilean Nitrate on account of liquidation.

Dividend Changes

Colgate-Palmolive-Peet has omitted quarterly dividend of 25c on common due at this time.

Standard Oil, N. J., declared semi-annual dividend of 50c, payable June 15 to stock of record May 16. Previously company paid 25c quarterly.

Sherwin Williams directors have voted to omit quarterly dividend of 25c on common due at this time. Regular quarterly dividend of $1.50 on preferred was declared payable June 1 to stock of record May 15. In previous quarter a common dividend of 25c was paid, and six months ago 37½c.

Devoe & Raynolds 1st Pfd.

Chase National, as trustee, announces that it has available $30,065 in cash for purchase for the sinking fund of so many of the shares of 1st preferred stock of Devoe & Raynolds, as shall be tendered and accepted for payment at a price not to exceed 115 and dividends. Tenders must be received before 3 p. m. May 19.

Annual Reports Show that——

Tabulation shows number of times interest charges and preferred dividend requirements have been earned in 1932, together with important balance sheet items, as abstracted from annual reports:

Company:	*Interest times earn.*	*Pfd. div. times earned*	*Cash and mark. securities*	*Inventories*	*Ratio cur. assets to cur. liab.*	*Working capital*
Columbian Carbon:						
Year, Dec. 31, 1932	No fd. dbt.	No pfd.	†$1,264,094	$3,441,455	12.4	$7,166,010
Year, Dec. 31, 1931	No fd. dbt.	No pfd.	†1,187,041	3,556,913	10.3	9,148,222
Eastman Kodak:						
Dec. 26, '31 to Dec. 31, 32	No fd. dbt.	16.37	$20,368,299	$29,476,937	8.3	$57,788,010
Year, Dec. 26, 1931	No fd. dbt.	36.24	27,110,785	33,541,840	5.0	61,354,983
Newport Industries, Inc.:						
Year, Dec. 31, 1932	No fd. dbt.	No pfd.	b383,579	733,324	10.9	1,222,538
Year, Dec. 31, 1931	No fd. dbt.	No pfd.	b1,112,176	591,981	5.8	1,616,539
Vanadium Corp.:						
Year, Dec. 31, 1932	a	No pfd.	‡906,963	2,822,427	12.3	3,625,773
Year, Dec. 31, 1931	a	No pfd.	‡1,275,533	3,601,744	11.9	5,442,944

†Cash only; a Loss before interest charges.

Earnings at a Glance

Company	Annual Dividends	Net Income 1933	Net Income 1932	Common Share Earnings 1933	Common Share Earnings 1932
Air Reduction Co., Inc.:					
March 31, quarter..	$3.00	$379,437	$652,214	$.45	$.77
Atlas Powder Co.:					
March 31, quarter..	f....	†8,031	†79,230	.....	.....
Com'l Solv. Corp.:					
March 31, quarter..	.60	224,758	293,454	.09	.11
Consolidated Chem Ind.:					
March 31, quarter..	a1.50	78,474	79,569	a.38	a.39
du Pont de Nemours & Co., E. I.:					
March 31, quarter..	2.00	5,480,515	9,689,433	j.33	j.74
Hercules Powder Co.:					
March 31, quarter..	1.50	226,978	87,205	.07	p.80
Newport Industries:					
March 31, quarter..	f....	†15,354	†56,541	....	....
Penick & Ford, Ltd.:					
March 31, quarter..	§1.00	‡319,674	‡175,831	....	....
Texas Gulf Sulphur Co.:					
March 31, quarter..	z.25	976,704	1,722,535	.38	.68
Union Carbide & Carbon:					
March 31, quarter..	z.25	1,658,465	1,981,440	.18	.22
Westvaco Chlor. Prod.:					
March 31, quarter..	f....	93,984	109,046	.19	.24
		1932	*1931*	*1932*	*1931*
Carman & Co., Inc.:					
Year, December 31.	f....	†89,518	83,562	....	b.11
Eastman Kodak:					
Year, December 31.	3.00	6,058,748	13,408,785	2.52	5.78
Imp'l Chem. Ind., Ltd.:					
Year, December 31..	6%	£4,229,072	£3,408,290	6.06%	4.18%
Tennessee Corp.:					
Year, December 31..	f....	†759,990	5,365	....	....
Union Carbide & Carbon:					
Year, December 31..	z.25	8,781,426	18,029,522	.97	2.00
United Dyewood Corp.:					
Year, December 31.	f....	†220,444	146,069	....	p3.87

*Not available; fNo common dividends; †Net loss; dDeficit; aOn Class A Shares; jOn average shares; §Plus extras; jLast dividend declared, period not announced by company; bOn class B stock.

Newport Industries' Loss in 1932

Newport Industries, and subsidiaries for year ended Dec. 31, 1932, (certified by independent auditors) shows net loss of $351,274 after taxes, depreciation, interest and other charges, but exclusive of $45,719 idle plant expense, which was charged to contingencies reserve previously provided for this purpose. This compares with net loss in 1931, of $423,475 (including results for the period Jan. 1, to Sept. 30, 1931, of the business acquired by Newport Industries, Inc., on Sept. 30, 1931) after taxes, depreciation, interest and other charges, including $57,662 write-down on inventories, but exclusive of a charge for year of $92,358 for idle plant expense.

Current assets as of Dec. 31, last, including $383,579 cash and marketable securities, amounted to $1,345,992 and current liabilities were $123,455. Consolidated income account for year 1932, compares as follows:

	1932	*1931*
Sales (net)	$1,745,367	$2,132,237
Cost and expenses	1,865,951	2,357,098
Loss	$120,584	$224,861
Depreciation	199,806	208,171
Charges for equipment dismantled	67,622	.....
Interest and other charges (net)	10,460	23,660
Loss	$398,472	$456,692
Profit from sale of stock	2,420	15,885
Dividends receivable	44,778	17,332
Net loss	*$351,274	*$432,475

*Exclusive of idle plant expenses amounting to $45,719 in 1932 and $92,358 in 1931.

Rossville Alcohol & Chemical Corp., and subsidiaries for seven months ended Dec. 31, 1932, certified by independent auditors, shows net profit of $30,358 after special write-down of raw materials, depreciation, etc. Capital stock at close of 1932 consisted of 148,752 shares, par $25, of 7% preferred and 202,892 no-par shares of common.

Combined statement of American Solvents & Chemical (predecessor company) and subsidiaries for five months ended May 31, 1932, and of Rossville Alcohol and subsidiaries for seven months ended Dec. 31, 1932, shows net loss of $128,231 after special write-down of raw materials, depreciation, interest, etc.

Nickel Reports Net 1932 Loss—$135,344

International Nickel (of Canada) and subsidiaries, for year ended Dec. 31, 1932 (certified by independent auditors), shows net loss of $135,344, after interest, taxes, depreciation, depletion, etc. This compares with net profit in 1931 of $5,094,497, equal, after 7% preferred dividends, to 22 cents a share on 14,584,025 no-par shares of common stock.

For quarter ended Dec. 31, 1932, net profit was $157,008, after charges and taxes, equal to 0.57% on $27,627,825 of $100 and $5 par value 7% cumulative preferred stock outstanding at close of period. This compares with net loss of $199,097 in preceding quarter, and net profit in December quarter of 1931, of $1,088,640, equal, after preferred dividends, to 4 cents a share on common stock.

Current assets as of Dec. 31, last, including $5,793,100 cash, government and other securities, amounted to $28,870,853, and current liabilities were $3,012,483. This compares with cash and government securities of $3,112,020, current assets of $29,243,671, and current liabilities of $3,793,028 at end of preceding year.

Consolidated income account for year 1932 (stated in terms of U. S. currency) compares as follows:

	1932	*1931*	*1930*	*1929*
*Earnings	$4,473,914	$10,556,001	$18,389,983	$29,353,073
Other inc	35,739	499,792	616,858	1,800,587
Gross inc	$4,509,653	$11,055,793	$19,006,841	$31,153,660
Gen exp	1,006,853	1,328,206	1,552,027	1,846,316
Fed taxes, etc	193,401	507,278	1,229,657	2,682,395
Interest	336,888	439,356	481,158	448,066
Dep. depl., etc	3,161,855	3,686,456	3,973,939	3,940,887
Net loss	$135,344	§$5,094,497	§11,770,060	§22,235,996
Pfd divs	1,933,909	1,933,937	1,933,920	2,040,501
Com divs	.....	6,560,468	14,148,941	12,375,704
Deficit	$2,069,253	$3,399,908	$4,312,801	†$7,819,791
P & L surp	74,612,754	76,890,459	‡80,778,815	73,387,700

Du Pont Quarter Profits $5,480,515

Du Pont and wholly owned subsidiaries for quarter ended March 31, shows net income of $5,480,515 after depreciation, obsolescence, interest, federal taxes, etc., comparing with $9,689,433 in first quarter of 1932. After deducting debenture dividends and including $21,937 company's proportion of losses of controlled companies not consolidated, there was a balance available for common stock in first quarter of 1933, of $3,825,428, equivalent to 35c a share (par $20) on $10,871,977 average number of common shares outstanding during the period. These earnings include dividends from G. M. investment amounting to 23c a share on du Pont common stock.

In first quarter of 1932, balance available for common stock, including $3,345 equity in undivided profits or losses of controlled companies not consolidated, was $8,059,134, equal to 74c a share on 10,943,767 average common shares. Earnings for that quarter included dividends from G. M. investment amounting to 45c a share on du Pont common.

American Zinc, Lead & Smelting and subsidiaries report for quarter ended Dec. 31, 1932, net loss of $25,149 after taxes, interest, depreciation, depletion and reserve for bad accounts. This compares with net profit of $5,540, equal to seven cents a share (par $25) on 80,329 shares of $6 preferred stock in preceding quarter. For year ended Dec. 31, 1932, net loss as compiled from quarterly reports, amounted to $64,965 after taxes and other deductions. This compares with actual net income for year 1931, of $212,445, equal to $2.64 a share on 80,329 shares of $6 preferred stock.

Consolidated income account for quarter ended Dec. 31, 1932, follows: Net sales $764,228; cost of goods sold $679,962; gross profit on sales $84,266; other income $14,473; total gross income $98,739; administrative, selling and other expenses $71,421; interest charges, net (credit) $3,466; depreciation and depletion $55,933; federal taxes (credit) $25,000; reserve for bad accounts $25,000; net loss $25,149.

Monsanto Earnings Are Higher

Monsanto Chemical and subsidiaries report for quarter ended March 31, net profit of $296,920 after charges, depreciation, federal taxes, etc., equivalent to 69c a share on 427,166 no-par shares of capital stock. This compares with $275,859 or 64c a share on 429,000 shares in first quarter of 1932.

Current assets as of March 31, 1933, including $1,984,961 cash and marketable securities, amounted to $5,897,007 and current liabilities were $1,049,981. This compares with cash and marketable securities of $2,111,844, current assets of $6,002,937 and current liabilities of $967,688 on March 31, of previous year. Earned surplus amounted to $3,162,783 against $2,795,557, and capital surplus was $2,368,202 compared with $4,122,279 on March 31, 1932. Consolidated income account for quarter ended March 31, compares as follows:

	1933	*1932*
Gross profit	$1,012,373	$1,040,032
General expenses	314,182	343,332
Depreciation and obsolescence	208,334	230,480
Research expenses	96,851	96,269
Operating profit	$393,006	$369,951
Other income	49,667	48,369
Total income	$442,673	$418,320
Interest, etc.	84,386	87,112
Federal taxes	61,367	55,349
Net profit	$296,920	$275,859
Dividends	133,389	133,314
Surplus	$163,531	$142,545

Atlas Cuts Losses to $8,031

Atlas Powder reports for quarter ended March 31, 1933, net loss of $8,031 after depreciation, taxes, etc., comparing with net loss of $79,230 in first quarter of 1932. Current assets as of March 31, last, including $5,207,312 cash, U.S. government securities and other marketable securities at cost, amounted to $9,065,569 and current liabilities were $351,007. This compares with cash, bank acceptances, U. S. government securities, etc., of $5,119,461, current assets of $9,745,450 and current liabilities of $545,426 on March 31 of previous year. Consolidated income account for quarter ended March 31, compares as follows:

	1933	*1932*	*1931*	*1930*
Sales	$1,875,413	$2,078,210	$3,299,121	$4,523,635
‡Net loss	8,031	79,230	†157,291	†350,697
Pfd divs.	147,913	147,913	148,006	135,000
Def aft pfd. divs.	$155,944	$227,143	*$9,285	*$215,697

*Surplus. †Profit. ‡After depreciation, taxes, etc.

Westvaco Makes Favorable Report

Westvaco Chlorine and subsidiaries report for quarter ended March 31, net profit of $93,984 after depreciation, federal taxes, etc., equivalent after dividend requirements on 7% preferred, to 19c a share on 284,962 no-par shares of common. This compares with $109,046 or 24c a common share in first quarter of 1932. Current assets as of March 31, 1933, including $312,824 cash and government securities, amounted to $1,204,925 and current liabilities were $121,843. This compares with cash and government securities of $207,724, current assets of $1,232,078 and current liabilities of $107,402 on March 31, 1932.

Commercial Solvents Nets 9c a Share

Commercial Solvents reports for quarter ended March 31, net profit of $224,758 after depreciation, interest, federal taxes and reserves, equivalent to 9c a share on 2,530,277 no-par shares of common. This compares with $293,454 or 11c on 2,530,174 shares in first quarter of 1932.

Imperial Chemical Industries gross profits were reported to be £6,415,425, compared with £4,668,685 in the preceding year, while net profits amounted to £4,729,072 compared with £3,408,290. In both years £1,000,000 was allocated to the central obsolescence fund, while the provision for income tax in 1932 was considerably more than double the corresponding figure in 1931.

After payment of dividends on the preferred and ordinary shares and the allocated to the central obsolescence serve, the amount carried forward is £543,770, compared with £516,825 brought forward from 1931.

Carbide Quarterly Earnings $1,658,464

Union Carbide reports for first quarter, ended March 31, net income, after all charges, of $1,658,464.64, equal to 18.42c a share on 9,000,743 shares. First quarter earnings of 18.42c per share compare with 22.01c a share in first quarter of 1932.

	First Quarter 1933	*First Quarter 1932*
Earnings (After Provision for Income and Other Taxes)	$3,606,240.33	$4,015,779.87
Deduct		
Interest on Funded Debt and Dividends on Preferred Stock of Subsidiary Companies	302,370.15	307,804.42
	$3,303,870.18	$3,707,975.45
Less		
Depreciation and Other Charges*	1,645,405.54	1,726,535.62
Balance	$1,658,464.64	$1,981,439.83
No. of Shares	9,000,743	9,000,743
Per Share	$ .1842	$ .2201

*Estimated.

Hercules Shows Greater 1933 Profit

Hercules Powder net earnings for first quarter were $226,978 as compared with $87,205 earned in 1932 first quarter. Earnings represent $.07 per share on 582,679 outstanding shares of no par common following payment of $185,255 preferred dividends. Dividends of $0.37½ per share were paid on common during the quarter. A strong financial position is shown with current assets of $14,421,000 at a 32 to 1 ratio to current liabilities of $452,000. Cash and U. S. Government securities total $6,239,407. Surplus is $9,551,021.

Canadian Industries Nets $3.65 in 1932

Canadian Industries, reports for year ended December 31, 1932 (certified by independent auditors), consolidated net income, including $706,339 income from investments but exclusive of $1,238 loss on sale of assets, of $2,772,900 after taxes, depreciation and other charges, equivalent after 7% preferred dividends, to $3.65 a share on 670,371 combined no-par shares of class A and class B common stocks. This compares with net income in 1931, excluding $27,795 profit on sale of assets, of $3,405,745, equal to $4.61 a share on 667,890 combined common.

Tennessee Corp. and subsidiaries for year ended December 31, 1932, certified by independent auditors, shows net loss of $759,990 after depreciation, interest, taxes, minority interest, etc. This compares with net profit in 1931 of $5,365, equal to less than one cent a share on 857,781, no-par shares of capital stock. Current assets, as of Dec. 31, last, amounted to $4,176,176 and current liabilities were $492,729, comparing with $4,952,319 and $662,176, respectively, at close of preceding year.

Consolidated income account for year 1932 compares as follows:

	1932	*1931*	*1930*	*1929*
Sales	$4,539,016	$7,572,760	$12,106,518	$12,395,407
Misc income	88,881	125,439	211,054	454,365
Total income	$4,627,897	$7,698,199	$12,317,572	$12,849,772
Costs, exp, tax, etc.	4,943,063	7,231,051	10,246,843	10,150,579
Interest	176,388	190,474	196,474	192,670
Deprec res	268,447	271,074	752,036	458,252
Fed tax res	.....	.....	73,565	132,881
Minority int	‡11	235	13,747	37,959
Net loss	$759,990	†$5,365	†$1,034,907	†$1,877,431
Dividends	.....	214,454	857,683	847,605
Deficit	$759,990	$209,089	*$177,224	*$1,029,826

*Surplus. †Profit. ‡Credit.

Newport Industries, and subsidiaries report for quarter ended March 31, net loss of $15,354 after depreciation, interest and other charges, comparing with net loss of $56,541 in March quarter of 1932. In first quarter of 1933, idle plant expenses amounting to $23,408 were charged against reserve previously created for that purpose and proportion of losses of affiliated company of $27,563 was charged to deficit account, comparing with similar charges of $31,129 and $47,492, respectively, in corresponding quarter of preceding year.

The Industry's Securities

1933 April Last	1933 High	1933 Low	1932 High	1932 Low	Sales In April	Sales During 1933	Stocks	Par $	Shares Listed	An. Rate		Earnings $-per share-$ 1931	Earnings $-per share-$ 1930
NEW YORK STOCK EXCHANGE													
64	66	55	66†	47½	63½	30⅞	92,500	229,500	Air Reduction	No	841,288	$3.00		4.54	6.32
86⅞	94⅜	74⅜	94½†	70⅜	88½	42½	288,700	1,056,600	Allied Chem. & Dye	No	2,401,000	6.00		6.74	9.77
116	119½	115	121¼	115*	120†	96½	2,900	9,800	7% cum. pfd.	100	393,000	7.00			
14¼	15⅝	10¾	15⅝†	7¼	15½	3½	31,100	51,200	Amer. Agric. Chem.	100	333,000		Yr. Je. '30		Nil
19¾	20½	16½	22⅜	13	27	11	58,700	109,800	Amer. Com. Alc. (new)	20	375,000				d1.27
17⅜	18½	13¼	18¼†	9¾	15½	7	10,500	14,100	Archer Dan. Midland	No	550,000	1.00	Yr. Aug. 30		1.68
14⅜	15½	9¾	15½†	9	25½	7*	11,100	19,400	Atlas Powder Co.	No	261,438			.59	2.67
64	64	60	66	60*	79½	45½	170	1,354	6% cum. pfd.	100	96,000	6.00			
36⅝	38½	26½	38½†	23¼	41⅛	13½	100,300	243,900	Columbian Carbon	No	538,420	2.00		3.02	5.04
16⅛	18¼	12⅜	18¼†	9	13⅜	3½	485,200	961,400	Comm. Solvents	No	2,530,000	.60		.83	1.07
66⅞	74	51¾	74†	45⅜	55⅜	24⅜	212,600	461,700	Corn Products	25	2,530,000	3.00		3.54	4.82
128	130	127	145⅜	117½	140	99½	1,040	2,670	7% cum. pfd.	100	250,000	7.00			
47	48¾	33⅝	48¼	32⅛	59¾	22	637,900	1,366,200	DuPont de Nemours	20	11,008,512	2.00		4.29	4.67
99½	99½	97½	106	97½*	105⅛	80¾	4,700	17,200	6% cum. deb.	100	1,098,831	6.00			
61	62½	46	62½†	46*	87⅛	35½	81,600	210,718	Eastman Kodak	No	2,261,000	3.00		5.78	8.84
115	125	115	130	115*	125	99	70	350	6% cum. pfd.	100	62,000	6.00			
28	29⅞	21	29⅛†	16¼*	28⅜	10	83,900	182,600	Freeport Texas Co.	No	730,000	2.00		3.26	w4.77
23	23½	16	23½†	15	29½	13⅞	24,300	32,300	Hercules Powder Co.	No	606,234	1.50		1.04	2.61
90	91	85	95½	85*	95	70½	360	1,750	7% cum. pfd.	100	114,241	7.00			
1⅞	2⅛	1⅛	2⅛†	⅞	3½	¾	7,700	13,400	Intern. Agric.	No	450,000		Yr. Je. '30		1.68
9⅜	9⅜	6	9⅛†	5	15	3¼	900	1,600	7% cum. prior pfd.	100	100,000	7.00	Yr. Je. '30		14.58
12⅝	15	7⅞	15†	6⅜	12½	3½	1,136,100	1,400,700	Intern. Nickel	No	14,584,000			.22	.67
11⅛	11½	7½	11½†	7½*	11	8	3,600	4,900	Kellogg (Spencer)	No	598,000	.60			h1.14
17⅞	19⅜	16	19⅛†	10¼	22	9	53,000	117,200	Liquid Carbonic Corp.	No	342,000			2.96	5.22
20¼	21⅞	15¼	21⅛†	14	20⅞	9	53,300	78,100	Mathieson Alkali	No	650,426	1.50		1.88	2.96
101	101	101	103	100½	105	89½	50	210	7% cum. pfd.	100	24,610	7.00			
37⅞	39½	29⅛	39½†	25	30⅜	13⅜	23,000	45,066	Monsanto Chem.	No	416,000	1.25		2.98	1.73
30⅞	32⅛	25⅛	32⅜†	16⅞	27¼	13	96,500	176,300	National Dist. Prod. cts. (new)	No	252,000			—	1.23
86	90	55	90†	43¼	92	45	7,500	9,900	National Lead	100	310,000	5.00			7.58
102⅜	102⅜	102⅜	110	101	125	87	100	2,455	7% cum. "A" pfd.	100	244,000	7.00			
85⅛	85⅛	85⅛	85⅛†	75	105	61	300	1,130	6% cum. "B" pfd.	100	103,000	6.00			
2⅞	3	1⅞	3⅛	1⅜	4⅜	1	6,700	12,500	Tenn. Corporation	No	857,000	1.00			1.21
23⅛	25	17	25⅛†	15⅛	26⅛	12	127,300	326,700	Texas Gulf Sulphur	No	2,540,000	2.00		3.52	5.50
30⅞	32	21⅛	32†	19⅜	36⅜	15½	337,700	767,300	Union Carbide & Carb.	No	9,001,000	1.20		2.00	3.12
15⅝	16⅜	10⅜	16⅜†	10⅛	18	6⅝	49,400	114,500	United Carbon Co.	No	398,000			—	1.43
25⅞	28¼	20⅛	28⅛†	13⅜	36⅛	13⅛	97,100	235,000	U. S. Ind. Alc. Co.	No	373,846			—	z2.96
16	17⅞	10	17⅞†	7⅝	23⅜	5¼	96,200	156,300	Vanadium Corp. of Amer.	No	378,367				2.95
1¼	1½	1	1½†	⅝	2⅜	⅞	8,800	16,100	Virginia Caro. Chem.	No	487,000		Yr. Je. '30		Nil
6½	7	5⅜	7†	3⅜	11¼	3⅜	4,500	10,100	6% cum. part. pfd.	100	213,000		Yr. Je. '30		2.63
40	41⅛	40	50⅛	35⅝	69¾	20	1,300	4,000	7% cum. prior pfd.	100	145,000		Yr. Je. '30		11.96
9⅜	10⅛	7½	10⅛†	5	12⅜	1	6,200	10,800	Westvaco Chlorine Prod.	No		1.00		1.79	2.51
NEW YORK CURB															
8¼	8⅜	7¼	8⅜†	3½	8½	1⅜	161,900	240,400	Amer. Cyanamid "B"	No	2,404,000			.21	
1½	1⅝	1	1⅝†	1*	2⅜	¾	1,100	1,100	Brit. Celanese Am. Rcts.	2.43	2,806,000				
46	46	27	46†	27*	55	8	2,825	4,590	Celanese 7% cum. part. 1st pfd.	100	148,000	7.00			
...	66½	51	66½†	51*	64½	17	620	1,445	" 7% cum. prior pfd.	100	115,000	7.00			
2⅛	2⅜	2	2⅜†	2*	5⅜	1⅛	600	600	Celluloid Corp.	No	195,000				
4½	4½	4½	5	4	6⅝	4½	400	1,600	Courtaulds, Ltd.	1£					
...	39⅜	35½	39⅜†	30	39	21⅛	1,400	2,500	Dow Chemical	No	630,000	2.00			3.44
¾	¾	¾	1	¾	1½	¼	100	1,200	Duval Texas Sulphur	No	500,000				
10½	11	8½	11†	8*	...	...	1,000	1,300	Heyden Chemical Corp.	10	150,000	1.00			
...	...	...	...	...	2⅞	2¼			Imperial Chem. Ind.	1£				1.21	
9¼	10½	8⅜	11¼	8	20⅜	6¼	3,800	9,200	Shawinigan W. & P.	No	2,178,000	1.00			
...	⅝	¼	¾	⅛	3	½	2,000	12,200	Silica Gel Corp.	No	600,000				
CLEVELAND STOCK EXCHANGE															
...	...	...	...	...	25	21¾			Cleve-Cliffs Iron $5 pfd.	No	498,000	5.00		—	11.42
...	38½	34½	38½†	30	40	21½	934	3,346	Dow Chemical Co.	No	630,000	2.00			3.44
...	98	96	...	...	...	...	40	40	Dow Chemical Co., pfd.	100	3,000,000	7.00			
112	112	112	122½	110	...	...	51	297	National Carbon, pfd.	100	5,600,000	7.00			
PHILADELPHIA STOCK EXCHANGE															
...	38	26¾	38†	25¼	40	19⅞	480	1,660	Pennsylvania Salt	50	150,000	3.00	Yr. Je. '30		7.97

1933 April Last	1933 High	1933 Low	1932 High	1932 Low	Sales In April	Sales During 1933	Bonds	Date Due	Int. %	Int. Period	Out-standing $
NEW YORK STOCK EXCHANGE											
79	79	75	80	70½	80	62	125	178	Amer. Cyan. deb. 5s	1942	5	A. O.	4,554,000
73½	75	64	83½	64*	80	54½	239	1,085	Amer. I. G. Chem. conv. 5½s	1949	5½	M. N.	29,933,000
4	4	2½	5½	2½*	18	1	60	136	Anglo-Chilean s. f. deb. 7s	1945	7	M. N.	14,600,000
51	51	37	51†	37*	60	34½	41	127	By-Products Coke Corp. 1st 5½s "A"	1945	5½	M. N.	6,629,000
...	102½	101	104½	101*	104⅞	100⅝	73	164	Corn Prod. Refin. 1st s. f. 5s	1934	5	M. N.	1,822,000
49	50	38½	42	38½*	54⅞	32	58	94	Int. Agric. Corp. 1st coll. tr. stamped to 1942	1942	5½		
4	4⅞	2½	5	2½*	15¼	½	311	764	Lautaro Nitrate conv. 6s	1954	6	J. J.	32,000,000
93½	96¼	92½	98½	87¼	97¾	67	91	252	Montecatini Min. & Agric. deb 7s with warrants	1937	7	J. J.	8,188,000
39½	49	38	62	38*	59	17	55	163	Ruhr chemical s. f. 6s	1948	6	A. O.	3,578,000
91½	92½	90	93	87	90	66	48	249	Solvay Am. Invest. 5% notes	1942	5	M. S.	15,000,000
...	58	50	58	50*	66	39	84	135	Tenn. Corporation deb. 6s. "B"	1944	6	M. S.	3,308,000
46½	47⅞	34½	48¼	34¼*	75	30	174	564	Vanadium Corp. conv. 5s	1941	5	A. O.	5,000,000
NEW YORK CURB											
56¾	57½	49	65	49*	76	55	409,000	1,432,000	Shawinigan W. & P. 4½s. "A"	1967	4½	A. O.	35,000,000
57	57½	50	64	50*	76	55	266,000	679,000	4½s., series "B"	1968	4½	M. N.	16,108,000
101⅛	101⅛	101⅛	103½	101	103½	99	11,000	36,000	Westvaco Chlorine Prod. 5½s	1937	5½	M. S.	1,992,000

h 11 mos. ending Aug. 30 w 13 mos.; Before inventory adjustment; *New Low; †New High

Chemical Exports and Imports

U. S. Chemical Export Figures for February

ARTICLES	FEBRUARY, 1933		TWO MONTHS ENDING FEBRUARY, 1933	
	Quantity	*Dollars*	*Quantity*	*Dollars*
COAL-TAR PRODUCTS		963, 223		1, 939, 708
Benzol.....galls..	50, 667	13, 562	859, 119	164, 442
Crude coal tar.....bbls..	309	1, 351	60, 075	140, 552
Coal-tar pitch.....tons..	27, 765	358, 064	49, 869	632, 761
Creosote oil.....galls..	2, 214	537	9, 175	1, 738
Coal-tar colors, dyes, stains, and color lakes.....lbs..	1, 745, 765	389, 906	2, 746, 607	674, 208
Other coal-tar products, exclusive of medicinals.....lbs..	2, 707, 049	199, 803	5, 754, 359	326, 006
INDUSTRIAL CHEMICAL SPECIALTIES		676, 112		1, 288, 782
Nicotine sulphate (40% basis)...lbs..	16, 545	8, 044	22, 869	12, 202
Lead arsenate.....lbs..	25, 341	1, 538	43, 403	2, 871
Calcium arsenate.....lbs..	99, 526	5, 292	329, 026	13, 750
Other agricultural insecticides, fungicides, and similar preparations and materials.....lbs..	282, 574	38, 255	643, 015	68, 025
Household insecticides and exterminators—				
Liquid.....lbs..	141, 610	46, 730	280, 037	84, 803
Powdered or paste.....lbs..	42, 078	5, 294	62, 773	10, 933
Household disinfectants, deodorants, germicides, and similar preparations.....lbs..	97, 298	8, 647	201, 672	17, 807
Baking powder.....lbs..	193, 717	43, 381	386, 780	84, 911
Petroleum jelly.....lbs..	819, 464	60, 981	1, 519, 004	93, 730
Tobacco extracts.....lbs..	205, 912	30, 262	244, 220	37, 718
Dextrine or British gum.....lbs..	1, 315, 891	42, 560	2, 577, 439	81, 392
Rubber compounding agents (accelerators, retarders, etc.).....lbs..	104, 653	52, 332	234, 880	117, 654
Cementing preparations, for repairing, sealing, and adhesive use..lbs..	202, 045	25, 330	331, 994	45, 930
Textile specialty compounds.....lbs..	548, 852	14, 496	1, 481, 914	35, 909
Water softeners, purifiers, boiler, and feed-water compounds.....lbs..	86, 998	20, 051	177, 476	30, 387
Metal-working compounds.....lbs..	30, 816	5, 182	68, 076	9, 357
Specialty cleaning and washing compounds (exclusive of soap).....lbs..	81, 530	7, 344	206, 469	19, 195
Polishes—				
Metal and stove polishes.....lbs..	50, 776	6, 831	97, 356	14, 253
Shoe polishes and shoe cleaners..lbs..	63, 745	16, 405	130, 010	35, 938
Leather dressings and stains...lbs..	306, 611	26, 190	548, 367	55, 302
Floor wax, wood and furniture polishes.....lbs..	56, 172	11, 074	103, 399	20, 289
Automobile polishes.....lbs..	71, 372	10, 736	89, 364	15, 296
Other chemical specialty compounds, n. e. s.		189, 157		381, 130
INDUSTRIAL CHEMICALS		1, 100, 664		2, 233, 295
Acids and anhydrides—				
Organic (exclusive of coal-tar acids).....lbs..	36, 993	3, 773	65, 275	8, 506
Inorganic—				
Hydrochloric (muriatic).....lbs..	864, 637	10, 426	1, 277, 477	16, 522
Boric (boracic).....lbs..	322, 970	13, 434	702, 178	29, 525
Other inorganic acids and anhydrides.....lbs..	768, 623	23, 251	1, 450, 985	54, 979
Alcohols—				
Methanol.....galls..	62, 613	25, 530	174, 735	71, 503
Butanol (butyl alcohol).....lbs..	110, 699	9, 371	393, 593	31, 097
Other alcohols.....lbs..	36, 515	5, 673	127, 811	12, 371
Acetone.....lbs..	76, 211	6, 082	421, 537	27, 644
Carbon bisulphide.....lbs..	192, 159	8, 328	386, 173	17, 347
Formaldehyde (formalin).....lbs..	418, 997	18, 285	787, 623	34, 708
Citrate of lime.....lbs..	688, 264	44, 827	1, 271, 134	81, 963
Other organic chemicals.....lbs..	695, 897	92, 053	1, 131, 811	162, 703
Nitro or acetocellulose solutions, collodion, etc.....lbs..	242, 161	33, 964	563, 939	88, 361
Aluminum sulphate.....lbs..	2, 410, 625	24, 412	5, 439, 244	54, 629
Other aluminum compounds....lbs..	139, 972	11, 262	194, 918	17, 623
Calcium carbide.....lbs..	192, 873	6, 667	274, 450	10, 002
Calcium chloride.....lbs..	225, 168	2, 448	695, 824	8, 761
Copper sulphate (blue vitrol)...lbs..	109, 824	2, 889	391, 395	9, 922
Hydrogen peroxide (or dioxide)..lbs..	17, 411	3, 279	63, 606	11, 454
Potassium compounds (not fertilizers).....lbs..	156, 309	14, 422	262, 451	27, 573
Sodium compounds.....lbs..	3, 653, 437	546, 487	62, 842, 979	1, 066, 570
Bichromate and chromate.....lbs..	461, 542	21, 167	1, 029, 742	52, 993
Cyanide.....lbs..	31, 607	4, 312	53, 053	7, 421
Borate (borax).....lbs..	13, 902, 069	185, 502	30, 825, 598	395, 420
Silicate (water glass).....lbs..	2, 725, 667	19, 179	5, 856, 812	44, 544
Soda ash.....lbs..	1, 338, 675	22, 445	3, 017, 453	52, 226
Sal soda.....lbs..	238, 606	3, 991	500, 908	7, 964
Bicarbonate (acid soda or baking soda).....lbs..	1, 363, 564	22, 710	2, 595, 342	42, 778
Hydroxide (caustic soda) in drums.....lbs..	9, 708, 165	203, 352	16, 418, 590	349, 598
Sodium phosphate (mono, di, or tri).....lbs..	168, 683	3, 994	734, 075	21, 550
Other sodium compounds....lbs..	714, 859	59, 835	1, 810, 835	92, 076
Tin compounds.....lbs..	2, 791	681	8, 410	2, 196

ARTICLES	FEBRUARY, 1933		TWO MONTHS ENDING FEBRUARY, 1933	
GROUP 8.—Continued.				
INDUSTRIAL CHEMICALS.—Continued.				
Gases, compressed, liquefied, and solidified—	*Quantity*	*Dollars*	*Quantity*	*Dollars*
Ammonia, anhydrous.....lbs..	96, 013	12, 883	161, 560	22, 665
Chlorine.....lbs..	941, 566	18, 370	1, 706, 381	36, 559
Other gases, n. e. s.....lbs..	104, 477	19, 256	402, 676	37, 344
Other industrial chemicals		142, 611		290, 768
PIGMENTS, PAINTS, AND VARNISHES		663, 625		1, 463, 518
Mineral-earth pigments—				
Ocher, umber, sienna, and other forms of iron oxide for paints..lbs..	339, 427	5, 904	807, 675	14, 753
Other mineral-earth pigments (whiting, barytes, etc.).....lbs..	217, 693	3, 214	611, 606	6, 425
Chemical pigments—				
Zinc oxide.....lbs..	74, 088	9, 147	153, 176	15, 549
Lithopone.....lbs..	161, 350	7, 304	269, 108	11, 760
Bone black and lampblack....lbs..	15, 892	1, 682	146, 786	8, 401
Carbon black or gas black.....lbs..	7, 612, 385	282, 467	19, 308, 359	721, 489
Red lead.....lbs..	125, 577	7, 082	154, 331	8, 953
Litharge.....lbs..	200, 490	7, 791	420, 341	16, 517
White lead—				
Dry.....lbs..	34, 971	1, 773	101, 207	4, 358
In oil.....lbs..	35, 495	2, 553	69, 895	5, 018
Other chemical pigments.....lbs..	339, 791	51, 733	712, 186	93, 356
Bituminous paints, liquid and plastic		15, 690		26, 251
Paste paint.....lbs..	94, 158	15, 171	205, 472	29, 686
Kalsomine or cold-water paints, dry.....lbs..	266, 851	14, 744	536, 563	28, 441
Nitrocellulose (pyroxylin) lacquers—				
Pigmented.....galls..	24, 076	56, 600	46, 748	111, 560
Clear.....galls..	5, 490	10, 746	9, 290	18, 235
Thinners for nitrocellulose lacquers.....galls..	22, 092	19, 566	38, 247	35, 815
Ready-mixed paints, stains, and enamels.....galls..	65, 735	124, 486	138, 055	256, 606
Varnishes (oil or spirit, and liquid dryers).....galls..	19, 775	25, 972	43, 619	50, 345
FERTILIZERS AND FERTILIZER MATERIALS.....tons..	59, 894	451, 639	116, 057	953, 948
Nitrogenous fertilizer materials—				
Ammonium sulphate.....tons..	551	12, 784	697	16, 529
Other nitrogenous chemical materials.....tons..	6, 712	157, 372	14, 956	333, 490
Nitrogenous organic waste materials.....tons..	573	5, 669	1, 012	13, 801
Phosphatic fertilizer materials—				
Phosphate rock—				
High-grade hard rock.....tons..	1, 554	10, 685	4, 518	31, 977
Land pebble.....tons..	47, 419	184, 153	87, 726	338, 623
Superphosphate.....tons..	1, 116	9, 442	1, 868	19, 328
Other phosphate materials...tons..	54	1, 634	159	8, 772
Potassic fertilizer materials.....tons..	850	35, 135	3, 320	133, 084
Nitrogenous phosphatic types (concentrated chemical fertilizers)..tons..	985	32, 650	1, 707	55, 647
Prepared fertilizer mixtures....tons..	80	2, 115	94	2, 697
EXPLOSIVES, FUSES, ETC		108, 092		189, 100
Explosives—				
Smokeless powder.....lbs..	10, 048	5, 258	13, 475	7, 359
Dynamite.....lbs..	492, 750	64, 490	741, 500	96, 841
Other explosives.....lbs..	10, 380	1, 926	50, 769	8, 172
Fuses and blasting caps—				
Safety fuses.....lin. ft..	3, 392, 485	15, 497	9, 115, 085	43, 428
Blasting caps.....No..	1, 822, 675	20, 921	2, 371, 075	33, 300
SOAP AND TOILET PREPARATIONS		366, 199		745, 560
Soap—				
Medicated.....lbs..	24, 329	14, 633	48, 925	30, 871
Toilet or fancy.....lbs..	316, 773	38, 715	723, 140	86, 560
Laundry.....lbs..	1, 222, 397	50, 071	2, 376, 519	95, 529
Powdered or flaked.....lbs..	68, 471	6, 043	101, 174	8, 490
Shaving creams.....lbs..	11, 347	5, 506	25, 697	12, 328
Shaving cakes, powders, and sticks.....lbs..	21, 438	5, 173	30, 530	10, 109
Other soap.....lbs..	35, 189	5, 108	80, 142	10, 110
Scouring soaps, bricks, pastes, and powders.....lbs..	180, 250	15, 502	400, 275	32, 074
Household washing powders....lbs..	33, 889	1, 867	126, 068	8, 526
Dental creams.....lbs..	111, 459	75, 114	193, 018	146, 830
Other dentifrices.....lbs..	47, 052	9, 088	72, 306	16, 720
Toilet powders—				
Talcum powder, in packages		26, 387		58, 279
Face powder		9, 744		18, 584
Compact		3, 204		5, 086
Creams, rouges, and other cosmetics—				
Cold creams.....lbs..	21, 642	11, 258	40, 891	21, 113
Vanishing creams.....lbs..	8, 099	25, 075	3, 497	7, 664
Other creams, lotions, and balms		14, 823		31, 527
Rouges		3, 881		8, 032
Lip sticks		6, 091		12, 069
Other cosmetics		4, 773		10, 358

Compiled from Monthly Summary of Foreign Trade of the United States, of the Dept. of Commerce

U. S. Chemical Import Figures for February

ARTICLES	FEBRUARY, 1933		TWO MONTHS ENDING FEBRUARY, 1933	
GROUP 8	*Quantity*	*Dollars*	*Quantity*	*Dollars*
COAL-TAR PRODUCTS		577,363		1,261,145
Dead or creosote oil free	921,681 gals.	75,548	1,146,270	91,956
All other crudes, free		65,258		116,229
Acids, dut	10,741 lbs.	889	23,871	6,134
All other intermediates, dut	70,634 lbs.	34,075	165,722	103,559
Colors, dyes, stains, color acids, and color bases, n. e. s., dut	330,565 lbs.	374,277	782,475	899,485
Coal-tar medicinals, dut	2,380 lbs.	6,400	3,945	16,276
Other finished products, dut	6,980 lbs.	20,916	9,622	27,506
MEDICINAL AND PHARMACEUTICAL PREPARATIONS		516,353		721,415
Quinine sulphate, free	507,408 ozs.	173,833	512,416	176,119
Other quinine and alkaloids, and salts from cinchona bark, free	379,100 ozs.	161,125	379,100	161,125
Other alkaloids, salts, and derivatives, dut		3,999		10,476
Antitoxins, serums, vaccines, etc., and blistering beetles, free		523		523
Menthol, dut	36,486 lbs.	70,759	62,886	120,624
Santonin and salts, free	33 lbs.	1,875	44	2,475
Other medicinals, dut		26,619		54,277
Preparations in capsules, pills, tablets, etc., dut		39,529		96,876
Other preparations, n. e. s., dut		38,091		98,920
INDUSTRIAL CHEMICALS		814,461		1,782,504
Acetylene, butylene, ethylene, and propylene derivatives, dut	19,385 lbs.	4,094	130,258	14,473
Acids and anhydrides—				
Acetic or pyroligeneous, dut	844,080 lbs.	53,145	3,518,760	220,788
Arsenious (white arsenic), free	1,571,388 lbs.	29,427	3,812,469	78,066
Formic, dut	37,361 lbs.	2,168	43,975	2,576
Oxalic, dut	lbs.		26,201	1,356
Sulphuric (oil of vitriol), free	163,550 lbs.	1,059	175,473	1,339
Tartaric, dut	75,040 lbs.	11,117	174,606	24,957
All other, free	lbs.		24,449	479
All other, dut	155,638 lbs.	15,865	209,271	25,991
Alcohols, including fusel oil, dut		522		842
Ammonium compounds, n. e. s.—				
Chloride (muriate), dut	436,419 lbs.	10,863	748,744	18,172
Nitrate, dut	271,693 lbs.	4,158	859,493	15,951
All other, dut	48,024 lbs.	2,836	75,789	4,755
Barium compounds, dut	222,809 lbs.	8,346	354,000	12,136
Calcium compounds, dut	77,161 lbs.	917	139,207	1,810
Cellulose products, n. e. s.—				
Acetate, dut	200 lbs.	141	200	141
All other—				
Sheets more than 3/1000 inch thick, and other forms, dut	7,155 lbs.	6,863	14,247	21,790
Sheets and strips more than 1 inch wide, not over 3/1000 inch thick, dut	555 lbs.	466	3,538	1,358
Cobalt oxide, dut	13,540 lbs.	12,057	32,556	27,011
Copper sulphate, gross weight	lbs.			
Copper sulphate, dut, copper content	lbs.			
Glycerin, crude, dut	438,761 lbs.	14,245	1,109,391	36,414
Glycerin, refined, dut	378,651 lbs.	21,524	489,328	28,118
Iodine, crude, free	lbs.		500	1,046
Lime, chlorinated, or bleaching powder, dut	104,166 lbs.	1,548	189,558	2,748
Magnesium compounds, dut	1,078,117 lbs.	14,352	2,006,409	25,191
Potassium compounds, n. e. s.—				
Carbonate, dut	764,101 lbs.	32,065	2,141,654	85,833
Chlorate and perchlorate, dut	1,351,525 lbs.	49,935	1,774,551	66,468
Cream of tartar, dut	lbs.			
Cyanide, free	17,361 lbs.	6,035	17,361	6,035
Hydroxide (caustic), dut	522,907 lbs.	26,638	838,854	43,525
Argols, tartar, and wine lees, free	933,339 lbs.	56,312	1,690,318	92,622
All other, n. e. s., dut	162,995 lbs.	8,323	315,808	19,976
Sodium compounds, n. e. s.—				
Sulphate (salt cake), free	4,847 tons	52,005	11,057	121,028
Sulphate, anhydrous, dut	599 tons	11,202	758	14,202
Chlorate, dut	11,023 lbs.	556	133,510	5,089
Cyanide, free	931,539 lbs.	87,555	2,004,700	170,225
Ferrocyanide (yellow prussiate), dut	112,136 lbs.	9,495	145,554	12,332
Nitrite, dut	lbs.			
Phosphate (except pyrophosphate), dut	4,763 lbs.	331	6,990	493
Other sodium compounds, n. e. s., free	11,000 lbs.	163	44,098	656
Other sodium compounds, n. e. s., dut		24,384	63,734	
Radium salts, free	12 grains	38,678	36	115,993
Other industrial chemicals, free		66,686		184,056
Other industrial chemicals, dut		129,385		212,729
PIGMENTS, PAINTS, AND VARNISHES		143,796		222,900
Mineral earth pigments—				
Iron oxide and iron hydroxide, dut	689,846 lbs.	13,532	1,095,048	18,765
Ochers and siennas, dut	487,644 lbs.	7,220	1,074,442	14,480
Other mineral earth pigments, dut		36,220		51,899
Lithopone and zinc pigments, n. e. s., dut	1,223,069 lbs.	35,637	1,503,069	42,541
Zinc oxide and leaded zinc oxide, dut	501,071 lbs.	21,409	944,166	41,240
Other chemical pigments, dut	66,826 lbs.	6,457	118,785	11,926
Paints, stains, and enamels, dut		22,188		40,705
Varnishes, dut	302 gals.	1,133	350	1,344
FERTILIZERS AND MATERIALS	89,165 tons	1,739,023	181,777	3,390,302
Nitrogenous—				
Ammonium sulphate, free	42,624 tons	695,174	81,268	1,294,580
Ammonium sulphate-nitrate, free	tons			
Calcium cyanamide, or lime nitrogen, free	5,294 tons	119,895	14,755	347,764
Calcium nitrate, free	2,283 tons	38,193	5,617	95,439
Guano, free	6,052 tons	138,340	6,372	141,908
Dried blood, free	231 tons	4,802	359	8,292
Sodium nitrate, free	2,516 tons	68,747	2,921	80,578
Urea and calurea, free	536 tons	43,383	917	69,526
Other nitrogenous, free	4,737 tons	81,366	5,744	98,035
Phosphates—				
Bone ash, dust, and meal, and animal carbon fertilizers, free	2,379 tons	41,221	4,836	83,337
Other phosphates, free	2,160 tons	28,248	5,659	59,998
Potash fertilizers—				
Chloride, crude, free	4,911 tons	178,881	11,562	419,500
Kainite, free	3,134 tons	27,092	9,821	89,953
Manure salts, free	6,463 tons	66,702	15,596	168,879
Sulphate, crude, free	2,167 tons	89,835	4,212	171,445
Nitrate, crude (saltpeter), free	1,141 tons	60,996	1,490	80,245
Other potash-bearing substances, free	182 tons	4,138	185	4,156
Fertilizer compounds, containing nitrogen, phosphoric acid, and potash, free	465 tons	23,040	1,009	44,470
All other, free	1,890 tons	28,970	9,454	132,197
EXPLOSIVES		5,481		7,676
Powder and other explosives, n. e. s. dut		2,771		2,771
Firecrackers, dut	25,862 lbs.	2,278	33,372	3,112
Fireworks and ammunition, dut		432		1,793
SOAP AND TOILET PREPARATIONS		116,539		226,536
Soap—				
Castile, dut	97,176 lbs.	7,338	265,873	20,124
Toilet, dut	46,508 lbs.	14,154	77,920	22,845
All other, dut	101,017 lbs.	7,281	190,429	14,154
Perfume materials, free	429 lbs.	21,838	1,076	34,159
Perfume materials, dut		37,958		72,066
Perfumery, bay rum, and toilet water, dut		12,244		25,603
Bath salts, dut	434 lbs.	140	610	256
Cosmetics, powders, creams, etc., dut		15,586		37,329
ARTICLES IN GROUP 8, ORDINARILY DUTIABLE, IMPORTED FREE		8,900		9,004

Export and Import Statistics

Total value of domestic merchandise exports in February amounted to $99,438,088 compared with a total value of general imports of merchandise of $83,803,193. These levels were the lowest our foreign trade has reached in several years, and reflects the severity of the decline in business throughout the world. Exports in the chemicals and related groups amounted to $5,108,644 and imports to $3,921,916. In January of 1933 the corresponding figures were respectively, $5,286,170 and $3,699,566. For the first two months of 1933 these figures are respectively $10,396,727 and $7,621,482. A comparison for the past three months is given below:

	December, 1932	*January, 1933*	*February, 1933*
Total exports	$129,056,731	$118,600,168	$99,438,088
Total imports	97,058,870	95,993,705	83,803,193
Chemicals, exports	6,169,970	5,286,170	$5,108,644
Chemicals, imports	3,258,780	3,699,566	$3,921,916

From the above statistics it is plain that although foreign trade (exports and imports) has shown sharp declines in the three months period, the rate of decline has been much greater in the general commodities than in our chemical trade. Our imports of chemicals actually increased in the three months December-February.

The Trend of Prices

Getting Well

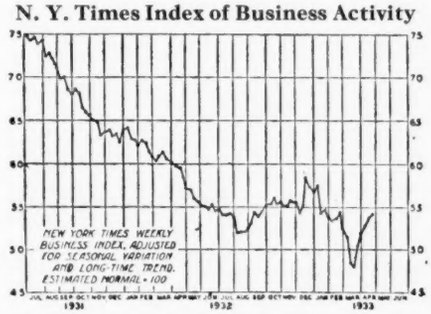
Trade and industry improved in April. Retail sales in all parts of the country expanded as a better feeling developed. Wholesalers, too, felt the generally depleted state of retail stocks and report greater interest in future commitments. The sudden abandonment of the gold standard and the inflationary measures proposed caused a general wave of buying and a rush to change dollars into commodities.

Even the so-called heavy industries showed signs of awakening from the lethargy that has effected them for many months. Steel production reached a 27-30 per cent. level,* automobile production increased for six consecutive weeks (ending April 29) and output, estimated at 155,000 units, was very close to April, 1932, levels. Sales were better than in the same period a year ago. Production for May will probably exceed that for any month since July, 1931. Carloadings have been increasing steadily upward. Failures were fewer in April. Bank clearings were slightly better, and electric power output has, in some instances, increased over the same period a year ago. The glass, shoe, textile, and building trades were more active.

The advance in commodity prices has, of course, been an outstanding feature of the news. Since the gold embargo went into effect rubber has advanced more than 40 per cent.; wheat 40 per cent.; silk 35 per cent.; cotton 10 per cent. Fisher's index rose from 56.4 on March 31 to 58.6 on April 28, and the *Journal of Commerce's* from 53.6 on April 1 to 57.6 on April 29. Fisher's index is now at the highest point since Dec. 16, 1932, and the *Journal of Commerce's* index closed the month at a record high for 1933. The level of commodity prices has now returned to approximately the level of this time a year ago.

The *N. Y. Times* Index of Business Activity has shown a continous climb from

N. Y. Times Index of Business Activity



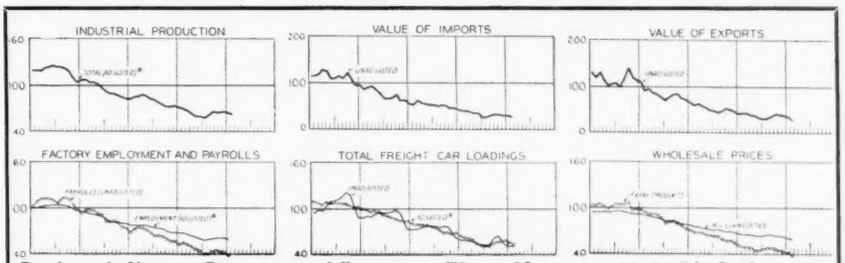
the depths reached immediately after the declaration of the banking moratorium on March 4. The figure, 54.2, was reached at the end of the week of April 22, which compares favorably with 58.5 for the corresponding week of 1932.

*Steel activity at the end of March—15 per cent.

Indices of Business

	Latest Available Month	Previous Month	Year Ago
Automobile Production, Feb.	106,814	130,114	117,418
–†Brokers Loans, Aprl 1	$310	$359	$533
*Building Contracts, Mar.	$59,958	$52,712	$112,234
–*Car Loadings, Apr. 22	492	494	562
†Commercial Paper, Mar. 31	$71	$84	$106
–†Elec. output, kwh., Apr. 22	1,431	1,409	1,469
Payrolls, Mar.	36.9	40.0	52.3
Failures, Dun, Mar.	$1,948	$2,378	$2,951
*Merchandise Imports, Mar.	$95,000	$83,000	$131,189
*Merchandise Exports, Mar.	$108,000	$100,000	$154,876
Furnaces in Blast, Apr. 1	13.3	15.8	21.1
*Steel Orders, Mar. 31	1,841	1,854	2,472

*000 omitted. †000,000 omitted. –Weeks, not months.



Business indicators, Department of Commerce. The weekly average 1923-25 inclusive = 100.

Following table gives combined index and its components, each of which is adjusted for seasonal variation and, where necessary, for long-time trend:

	Week Ended Apr. 22 1933	Apr. 23 1932	Mar. 25 1933
Freight car loadings	52.5	59.2	50.6
Steel mill activity	24.1	24.2	14.6
Electric power	64.4	70.8	62.8
Automobile production	39.2	33.5	19.9
Carded cotton cloth	....	75.4	90.9
Combined index	54.2	58.5	50.4

Effect on Chemicals

Chemical shipments were in better volume and prices reacted sharply to the new conditions. The immediate effect of our going off the gold standard was, of course, to depreciate the value of the dollar in foreign markets in terms of foreign currency (an average of 8-14 per cent.). Chemicals largely imported and the more important metallic salts were marked up at once. Quotations from abroad were largely nominal. In several items a rush was started to cover by contract which helped to boost prices still higher. In addition, the improvement, that might be termed legitimate improvement, helped to give the markets a very firm tone.

Several of the large consuming industries were more active in buying. The return of beer, an increase in building, and a higher rate of activity in the Detroit area helped the glass industry, and in turn the ash producers. Seasonal improvement was at last noticeable in the paint, lacquer and varnish fields, and of course, in fertilizer materials. Textiles picked up at least part of the losses made in February and March. On the other hand, the paper and tanning trades showed only slight improvement, the latter affected principally by the continuance of the strike in the Boston area. Better demand for steel and a heavier automobile production schedule (11 producers increased activity against one decline) also accounted for a large tonnage movement. Seasonal items, such as anhydrous ammonia, copper sulfate, calcium chloride, tartaric, and citric acids, sodium chlorate, alum and chlorine for water purification purposes, were taken out in larger quantities.

A list of the more important price changes is given below, and more detailed comment on each given in the following pages. However, a few increases and two or three decreases stand out prominently. Casein after months and months of weakness has turned sharply upwards; sodium nitrate was advanced $1 a ton. This was largely the result of a decline of warehouse stocks in this country from over 500,000 tons to about 100,000 tons; methanol, denaturing grade in tanks, was advanced 2c a gal.; both dextrin and starch were higher, reflecting the bullish tone in corn; the organic ammoniates, blood, tankage, and nitrogenous material, went into new high ground as spot stocks became scarce; the tin salts—oxide, crystals, and tetrachloride, were quoted at much higher levels in response to the higher metal price. Naval stores, shellac, practically every vegetable, animal, and fish oil of any importance, many of the gums, and most of the waxes, and several of the more important paint products, including the lead pigments, rose suddenly as a result of inflation.

On the downward side the pronounced weakness of the past few months in carbon tetrachloride forced producers to restablish lower schedules; calcium chloride, flake in carlots, was reduced $1.50 a ton; red prussiate of potash finally was openly quoted at 32½c; aluminum chloride, anhydrous, was off 1c.

Buyers of nitrate are awaiting the outcome of the very secret nitrogen conference being held in N. Y. City. The course of the market for sulfate and nitrate depends largely upon the agreements that may result from this meeting. The fertilizer market is also awaiting with keen interest the publication of the new potash schedule. A possible indication of what may be expected was the advance of 5/8c a lb. for imported caustic potash and an advance in the several grades of potash carbonate.

That the country is, now committed to a new policy, that of inflation, is, of course, self-evident. Just how far the administration will carry such a policy is the unknown factor. Wild, reckless, uncontrolled inflation is quite unlikely. Yet, it will be difficult to exert just the proper check. But, in any event, all appearances point now to still higher prices along a still wider front. The extent so far is reflected in the following N. F. A. Price Indices:

Group	*Latest Week April 22 1933*	*Preceding Week*	*Month Ago*	*Year Ago*
Textiles	45.8	43.7	43.6	47.0
Misc'l commodities	58.6	58.2	58.3	60.6
Automobiles	84.9	84.9	84.9	89.2
Building materials	71.7	71.6	71.3	72.9
Metals	68.2	66.9	68.3	71.8
Fats and oils	48.2	43.9	42.2	41.8
Chemicals and drugs	87.2	87.1	87.4	87.9
Fertilizer materials	61.5	61.5	61.1	71.1
Mixed fertilizer	62.4	62.4	62.5	73.3
All groups comb.	58.2	57.1	57.0	61.9

Important Price Changes

Advances	April	March
Albumen, egg	$0.76	$0.74
Vegetable	.65	.60
Blood, dried	2.25	2.00
Camphor, slabs	.40	.38
Powdered	.40	.38
Carnauba, Wax, flor	.25	.23
No. 1, Yellow	.23	.20
No. 2, Regular	.22	.20
No. 3, N. C.	.16	.12
No. 3, Chalky	.13½	.12
Casein	.08¾	.07
Copper sulfate	2.35	3.00
Cream of Tartar, imp	.16¼	.15¼
Dextrine:		
White	3.24	3.09
Gum	3.54	3.39
Canary	3.29	3.14
Egg yolk	.41	.40
Lead, red	.07	.06¾
Litharge	.06	.05¾
Sulfate	.06	.05¾
Linseed, cake	18.75	18.50
Methanol, denat. grade tanks	.37	.35
Mercury	55.50	54.50
Nitrogenous, material	1.80	1.60
Potash, caustic, in p	.06¾	.06½
Potash, carbonate 80-85%	.05⅞	.04⅞
Hydrated 83-85%	.05⅝	.05⅛
Silver nitrate	.23⅞	.21¾
Sodium nitrate, bulk	24.90	23.90
200 lbs.	26.20	25.20
100 lbs.	26.90	25.90
Spermaceti, blocks, cases	.19	.18
Cakes, cases	.20	.19
Superphosphate, Balt. run of pile	6.50	6.25
Flat, 16%	7.00	6.75
Tankage, ground	2.00	1.75
Unground	1.75	1.65
Tin crystals	27½	25
Oxide	35	27½
Tetrachloride	.1607	.1344

Declines	April	March
*Aluminum Chloride, anhyd.	.04	.05
Calcium chloride, flake	19.50	21.00
Solid	17.50	18.00
*Carbon Tetrachloride, drms.	.05¼	.06¼
Potash, prussiate, red	.32½	.34
Tartar emetic, tech	.20	.21
U. S. P.	.25	.26
Wood flour	18.00	20.00

*See market report for complete schedule.

Acetone — Buying was still very much of a routine nature. Price structure was somewhat firmer. Trade was watching closely attempt of Commercial Solvents to have Union Solvents declared in contempt.

Acid Acetic — Several of the more important consuming industries have failed to reach better production levels, thus affecting consumption to a noticeable degree. Acetate of lime has been firm at $2.50, and with summer curtailment about to go into effect statistical position is good. February production figures are on page of this issue (Heavy Chemical Section).

Acid Chromic — Producers report a slight betterment in demand from the automotive centers. Previous quotations were continued.

Acid Citric — Continued cold weather prevented as great a seasonal improvement as generally takes place, but demand in the last week of the month was reported as being quite satisfactory. Abandonment of gold standard should ease the competitive position between domestic and imported with the possibility of higher prices.

Acid Oxalic — Buying was largely of the hand-to-mouth variety.

Acid Sulfuric — Improvement in steel activity to 27 per cent., and better production in fertilizers helped to move a greater tonnage in April. In Baltimore 60 degree acid is reported quoted around $7.50-$8 a ton and 66 degree about $3.50 a ton higher.

Acid Tartaric—Foreign importers set a price of 240 lires in bond, c. i. f., N. Y. With the duty of 8c this is equivalent to about 22c a lb. Domestic producers continued to quote 20c. This left importers in a rather bad position on future business.

Alcohol — Rumors were current in parts of the trade that a 10c advance might be made as of May 1 but these proved to be unfounded. However, raw materials are advancing and the market has taken on a much firmer appearance. Higher prices await further developments of (1) alcohol-gasoline fuel mixtures; (2) higher grain prices (3) higher blackstrap prices. Quotations for denatured to be delivered during period April 1 to June 30, 1933:

	Cents per gallon
*C. D. No. 5 drums, car lots	38.5
5 to 9 drums	44.5
1 to 4 drums	46.5
S. D. No. 1 tanks	30.4
drums, car lots	34.6
9 to 19 drums	40.6
20 drums	36.6
1 to 4 drums	42.6
barrels, car lots	37.6
5 to 19 barrels	43.6
1 to 4 barrels	45.6

*Credit of 1c. per gallon given on purchases of car lots or more.

Aluminum Chloride — Producers announced new schedule during third week of April for anhydrous as follows:

Up to 100 lbs	lb.	.08
140 to 875 lbs.	lb.	.07
1,100 to 11,000 lbs.	lb.	.06
12,100 to 40,000 lbs.	lb.	.05
45,000 lbs. and up	lb.	.04

Alums — Better inquiry was reported. Seasonal increase for water purification purposes is now eagerly looked for. Shipments to paper trade were still slow. Of the March exports of 3,996,909 lbs., Canada consumed 2,856,984 lbs.; Panama, 947,400 lbs.; Mexico, 3,015 lbs.; Cuba, 144,140 lbs.; Argentina, 2,000 lbs., and Columbia, 16,000 lbs.

Ammonia, Amhydrous — Seasonal improvement was in evidence. Prices were firm and unchanged. Of the March exports of 79,827 lbs., Union of South Africa consumed 11,103 lbs.; Philippine Islands, 5,000 lbs.; Canada, 17,759 lbs.; British Honduras, 1,262 lbs.; Honduras, 1,235 lbs.; Panama, 6,532 lbs.; Mexico, 3,938 lbs.; Cuba, 1,308 lbs.; Venezeula, 1,210 lbs.; British India, 2,000 lbs., and China, 20,000 lbs.

Ammoniates — Scarcity of spot stocks and improvement in prices for sulfate and nitrate brought about a sharp upward revision of tankage, nitrogenous material, and dried blood prices. Imports of fertilizer and fertilizer materials during March totaled 97,507 long tons, compared with 100,136 long tons for March, 1932. This is a decrease of about three per cent. Exports for March totaled 85,481 long tons, against 75,732 long tons for last March, or an increase of about 13 per cent. Following important materials were imported in larger volume during March as compared with the same month a year ago; ammonium sulfate, calcium cyanamid, calcium nitrate, urea and calurea, muriate of potash, sulfate of potash and "other fertilizers." Sharp declines were noted for practically all phosphate materials, kainite and manure salts. Imports of sodium nitrate totaled 106 tons, compared with 54 tons for March, 1932, and more than 120,000 tons imported during March, 1931. During March, larger exports were noted for other nitrogenous chemicals (chiefly domestic synthetic sodium nitrate), land pebble, potash fertilizers and concentrated chemical fertilizers.

Ammonium Sulfate — A much firmer tone appeared in the market for domestic material as most of the foreign quotations were withdrawn. Domestic was quoted at $23 in the South and $21 in Northern points. Most of the business placed was done at $22-$23 at ports in the North and $21 at ovens. March output of sulfate of ammonia, or its equivalent, as estimated from the domestic operation of by-product coke ovens, was 28,257 tons, against 27,823 tons in February, 30,278 tons in January and 35,480 tons in March last year. Estimated output for first quarter of 1933 was 86,356 tons against

104,473 tons in corresponding period of 1932. March imports of sulfate were 41,208 tons, against 42,624 tons in February and 38,644 tons in January. New supply of sulfate during first three months of 1933, as represented by sum of the imports and estimated domestic production was 208,832 tons.

Benzol — The particularly firm position of this item remained unchanged in April, but producers made no further price advances. Statistics reveal a March production of 3,705,778 gal. of benzol, as against 3,687,535 gal. in February and 4,929,000 gal. in March last year, being estimated from the production of coke at by-product ovens known to recover benzol.

Calcium Chloride — Producers reduced quotation for flake material on car lot quantities $1.50 per ton, and solid was lowered 50c. New schedule:—Flake, 77 to 80 per cent., car lot, works, drums, $19.50 per ton; less than car-lot schedule for N. Y., $1.78 to $1.93 per 100 lbs., according to point of shipment; solid, 73 to 75 per cent., car lot, drums, $17.50 per ton, with the less than car-lot shipments for N. Y. at $1.58 to $1.83 per 100 lbs. It is thought that this was largely done to meet economy programs of normally large state and municipal buyers. Of the March exports of 410,204 lbs. Canada consumed 280,606 lbs. Panama, 25,672 lbs.; Mexico, 95,613 lbs.; Bermudas, 7,000 lbs.; Columbia, 513 lbs.; and Republic of Haiti, 400 lbs.

Copperas — Despite fact that steel activity reached 27 per cent., demand for copperas was sufficient to keep market in a firm state.

Copper Sulfate — Metal advanced strongly to 6½c as a result of administration's inflationary policies and the abandonment of the gold standard, and producers of vitriol raised the base carlot price from $3.00 to $3.25. It has been shown that the average price of the metal in 1932 was 3c below production costs.

Camphor — Prices gyrated upward. Slabs or powder closed at 42-43c. While sales were not large importers based quotations on replacement cost in primary market.

Carnauba Wax — Prices advanced rapidly when the gold embargo was announced. Stocks available here were small. Quotations as the month closed:—No. 1, 23c to 25c per lb.; No. 2 yellow, 22c to 23½c; No 2 N. C., 16c to 17c; No. 3 N. C., 12½c to 13c; No. 3 chalky, 12½ to 13c. Exports from Brazil during 1932 totaled 6,379,714 kilos. Shipments were distributed as follows:—

	Kilos
Argentina	32,010
Australia	7,644
Belgium	268,780
Chile	7,076
Danzig	2,025
England	1,019,554
France	563,899
Germany	1,490,437
Holland	79,004
Italy	98,731
Portugal	3,088
Spain	41,097
United States	2,758,555
Uruguay	7,814

Carbon Tetrachloride — Market had been quite weak for the past few months. In addition to the fact that the schedule had not been revised downward during the depression, a new factor entered the market. In April an entirely new schedule was introduced, reductions in each case amounting to about 1c lower than the former published price. It is reported that the new figures were being fairly well adhered to.

Casein —Past month or two has witnessed an entirely different trend in the market. Prices have advanced rapidly, particularly in the last half of April. Stocks are low, and the firm position is more than likely to continue indefinitely.

Coaltar Chemicals — Much better conditions in steel did not have any adverse effect on the market. With very little if any excess stocks to worry about, and a slight pickup in the call for most items, position of the market remained decidedly firm. Demand for intermediates was irregular, as was also that for dyes. In certain textile lines the in-between season caused some slackening in operations. Statistics just released by the Dept. of Commerce shows that March production of by-product coke amounted to 1,666,035 tons, or 53,743 tons per day, as compared with daily rate of 58,529 tons in February. Daily output at merchants plants declined only 4.3 per cent., while that at furnace plants fell off 11.8 per cent., practically same decline that occurred in rate of pig-iron production for the month. Stocks at by-product plants decreased from 2,831,248 tons to 2,702,905 tons, or 4.5 per cent., during the month; all of the decrease occurred at merchant plants, there being a slight increase at furnace plants. Stocks on hand at the end of the month were equivalent to 50.3 days' production at current rate. Coking coal charged in by-product ovens in March amounted to 2,407,962 tons as against 2,370,763 tons in February and 3,023,400 tons in March a year ago. Light oils recovered totaled 7,368,363 gal. in March as compared with 7,215,146 gal. in February and 9,251,604 gal. in March last year. Production of light oils for first quarter of the current year totaled 22,617,105 gal. as against 27,372,321 gal. in same period 1932. Output of tar in March aggregated 22,153,250 gal. as compared with 21,811,019 gal. in February and 27,815,280 gal. in March last year. Output of tar for first three months of current year amounted to 70,701,493 gal. as against 82,295,840 gal. in corresponding quarter last year. Production of ammonia sulfate, or its equivalent, in March totaled 28,257 tons as against 27,823 tons in February and 35,480 tons in March, 1932. Production for first quarter totaled 86,356 tons as compared with 104,473 tons in the similar period last year.

Dextrin — Producers advanced quotations 15c per 100 lbs., with the new schedule as follows:—British, gum, $3.39 to $3.59 per 100 lbs.; $3.24 to $3.34 per 100 lbs. for the canary corn, and the white was listed at $3.09 to $3.29 per 100 lbs. No change was made in the potato or tapioca materials. The increase was largely the result of the decided bullish tone of the grain markets.

Ethyl Acetate — With somewhat improved conditions in the automotive field, market for solvents appeared to be much firmer.

Glycerine — Dynamite grade was advanced to 8¼c in carlots and 8¾-9c less carlot. Contract withdrawals were in fairly good volume, but spot sales were only fair. A firmer tone in crude was reported although no change in the established schedule was made. C. P. was strong at Chicago.

Insecticides — Both Bordeaux Mixture and calcium aresnate were in better demand.

Lead Pigments — Rise in metal market caused corroders and producers to advance quotations on red lead, white lead, sulfate and orange mineral. New schedule is given in the prices. Outlook is for firm prices and possibly further advances.

Lithopone — Market was featured by a large number of buyers who attempted to negotiate contracts for six months. April tonnage was the best month of the year.

Mercury — Importers were forced to immediately increase quotations as the restrictions on gold were announced, and latest figure given out was $55.50 a flask. Market has been in a much better state in the past few months. Italian exports of mercury, which had dropped from 695 tons in 1930 to 490 tons in 1931, recovered to 830 tons last year, the principal markets in 1932 being: Germany, with 170 tons; Japan, with 163 tons; British India, with 122 tons; and Hong Kong, with 89 tons. Countries showing a decline in their takings of Italian mercury last year included Austria, Belgium, France, and Great Britain.

Naphthalene — Although no price advance was made market was decidedly firmer as a result of the higher quotations on monetary exchange rates. Demand was only fair. Of the 2,244,065 lbs. imported in March, 388,303 lbs., came from Germany; 1,783,362 lbs. from the United Kingdom and 72,400 lbs. from Canada.

Naval Stores — Quotations were advanced sharply in Southern primary centers and in local markets. Some of the grades of rosin went to new highs for 1933. Movement in the first month of the new naval stores year was not as large as was hoped for. Factors are scanning statistical data closely, hoping to arrive at some definite decision as to whether production this year is likely to exceed last year's figures. Opinion is about evenly divided. Based on figures now available it appears production will reach about 424,000 units, or an increase of nine per cent. over last

year. Despite the higher price levels, movement of turpentine was of a very conservative character. Buyers seemed to be willing to wait on further developments.

Petroleum Spirits — After the opening of the East Texas field on April 24 price of crude again collapsed, and 10 cent oil prices were again posted. This had the effect of weakening price structure for various petroleum solvents, although most producers continued to openly quote former prices. However, in some cases, slight concessions were offered, and in one or two directions it was reported that Stoddard was offered at 4c and V. M. & P. naphthas at 3¾c. Petroleum thinners were also offered at slightly lower than published quotations.

Phosphate Rock — Former prices were continued. March exports were considerably ahead of February with foreign shipments of 2,917 tons of high-grade hard and 70,078 tons of land pebble, against 2,964 tons of high-grade and 40,307 tons of land pebble in February. Japan and Denmark bought greater quantities in March.

Potash — Domestic producers have made arrangements whereby spot and contract prices and discounts which expired May 1 will be continued until such time as 1933-1934 contract prices are announced. It is possible that the foreign producers will withhold announcing schedule until they have a better opportunity to judge what the normal level of the dollar in foreign exchange will be. Spot buying was reported in some sections of the country to be quite brisk.

Potash Carbonate — Cable advices raised all prices here ½c. Increase is direct result of depreciation of the dollar in Germany and France, both of which are still on a gold standard. Of the March imports of 758,396 lbs., Czechoslovakia shipped 111,507 lbs.; Germany, 493,160 lbs., and Netherlands, 153,345 lbs.

Potash Caustic — For the same reason that the carbonate was advanced importers raised caustic prices 5/8c. Although domestic producers had not followed suit up to the end of the month, it was reported on excellent authority that such increase might be expected momentarily.

Potash Chlorate — While no advance was actually posted market assumed a much stronger tendency, due to higher exchange rates. Of the 705,340 lbs. imported in March of perchlorate and chlorate, France shipped 136,667 pounds; Germany, 561,953 lbs., and Sweden, 6,720 lbs.

Potash, Prussiate, Red — The rather severe competitive position between imported and domestic finally resulted in a revision of the announced schedule to 32½c a lb.

Shellac — Prices went higher in April in response to the decline of the dollar in foreign exchange. Quotations (spot) as the month closed were as follows: T. N. 9½c to 10¼c per lb. according to quantity; superfine, 10½c to 11¼c, also as to quantity taken. Bonedry minimum at 18c per lb. for 10 barrels or more, one delivery and the range as to quantity was to 20c. Shellac varnish was firm at unchanged levels.

Soda Ash — Movement of ash into the glass trade featured the market. Prices for l.c.l. was somewhat steadier in the Metropolitan district.

Soda Caustic — Curtailment in rayon production still continued to affect adversely tonnages.

Sodium Bichromate — A firmer tone to the spot market was in evidence. Contract withdrawals for the chemical and dry-color producers were in fair quantities but shipments to the textile and tanning trades were unsatisfactory. The strike situation in Peabody remained unchanged with both factions adamant. An advance in spot prices is not an entirely remote possibility in the near future.

Sodium Cyanide — Pickup in plating and case-hardening helped to expand the market. Prices were firm and unchanged. Of the March imports of 877,840 lbs., France shipped 197,800 lbs.; Netherlands, 17,000 lbs., and Canada, 663,040 lbs.

Sodium Nitrate — After two weeks of rumors, nitrate was advanced on April 25 $1 a ton. This was largely brought about by decline in stocks in this country from about 500,000 tons to 100,000 tons, and, also, because exporting countries, off the gold standard with depreciated currencies were withdrawing low quotations on sulfate. New schedule for April, May, June delivery:—To fertilizer manufacturers, $24.90 per ton, in bulk; $26.20 in 200-lb. bags; and $26.90 per ton in 100-lb. bags: to fertilizer dealers, $26.80 per ton in 200-lb. bags; and $27.50 per ton in 100-lb. bags. These prices were ex-vessel, at usual ports.

Sodium Phosphate — Weighting operations were rather slow. Volume of di-salt was disappointing. Tri-material was in slightly better call. No price changes were made.

Stearates—As the month closed producers had not made any decided move on prices, but ½c advance of stearic acid. April 26 was thought to be the forerunner of price increases. Cobalt driers were very firm.

Sulfur — Firm tone remained unchanged. Business in April was thought to have been slightly greater than in March. Exports in March amounted to 23,213 tons against 22,196 tons in February and 9,556 tons in January.

Superphosphates — Producers generally instituted a 50c advance during April and some makers raised their level as much as $1 a ton. A better demand has helped to reduce stocks, and the possibility of further imported material coming in at low prices seemed more remote as the gold standard was discarded. Production of bulk superphosphates in January was 227,154 tons and totaled 189,664 tons in February, based upon data received from 84 manufacturers operating 155 plants during the latter month. In January, 156 plants operated. February shipments of bulk superphosphate were 101,090 tons, against 89,749 tons in January, while stocks at the end of February were 1,064,012 tons, against 1,089,657 tons at the end of January. Production of base and mixed goods in January was 6,507 tons, and 8,102 tons in February. Shipments were 35,304 tons in January and 51,689 tons in February, while stocks on hand were 459,650 tons at the end of January and 547,599 tons at the close of February.

	Short tons	
	**February 1933*	*January 1933*
Production and receipts—		
Production—		
Bulk—		
Total U. S.	189,664	227,154
N. dist.	92,401	129,262
S. dist.	97,263	97,892
Base and mixed goods—		
Total U. S.	8,102	6,507
N. dist.	4,062	2,967
S. dist.	4,040	3,540
Received from other acidulators (including inter-company transfers) †—		
Total U. S.	17,284	24,705
N. dist.	10,851	14,652
S. dist.	6,433	10,053
Shipments—		
Bulk—		
Total U. S.	101,090	89,749
N. dist.	50,093	62,872
S. dist.	50,997	26,877
To mixers—		
Total U. S.	58,883	55,737
N. dist.	37,329	41,238
S. dist.	21,554	14,499
To other acidulators including inter-company transfers)—		
Total U. S.	10,815	17,824
N. dist.	4,916	14,581
S. dist.	5,899	3,243
To consumers—		
T. U. S.	31,392	16,188
N. dist.	7,848	7,053
S. dist.	23,544	9,135
Base and mixed goods—		
Total U. S.	51,689	35,304
N. dist.	15,640	10,655
S. dist.	36,049	24,649
Stocks—		
Bulk—		
Total U. S.	1,064,012	1,089,657
N. dist.	428,624	432,209
S. dist.	635,388	657,448
Base and mixed goods—		
Total U. S.	547,599	459,650
N. dist.	288,774	243,386
S. dist.	258,825	216,264

*Preliminary
†Includes both bulk superphosphates and base and mixed goods.

Tanning Materials — Practically all of the natural tanstuffs were advanced because of the exchange situation.

Tin Salts — With abandonment of the gold standard tin quotations rose sharply, forcing producers of oxide, crystals and anhydrous tetrachloride to make several advances. This market will now fluctuate more frequently.

Varnish Gums — In order to protect themselves against currency changes importers were offering most items at an advance of about 10 per cent. Buying was brisk, when compared with March tonnages.

Zinc Oxides — Domestic material was offered at unchanged prices. Importers continued to quote subject to currency fluctuations, but without any definite price advance.*

*Fats & Oils Market Comment will be found this month in the Oils & Fats News Section.

Prices Current

Heavy Chemicals, Coaltar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Naval Stores, Fatty Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Imported chemicals are so designated. Resale stocks when a market factor are quoted in addition to makers' prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1932 Average $1.64 - Jan. 1932 $1.54 - April 1933 $1.75

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Acetaldehyde, drs lc-l wks...lb.	.18½	.21	.18½	.21	.18½	.21
Acetaldol, 50 gal dr.....lb.	.27	.31	.27	.31	.27	.31
Acetamide.....lb.	.95	1.35	.95	.35	.95	1.35
Acetanilid, tech, 150 lb bbl...lb.	....	.26	...	.26	.20	.26
Acetic Anhydride, 92-95%, 100 lb cbys.....lb.	.21	.25	.21	.25	.21	.25
Acetin, tech drums.....lb.	.30	.32	.30	.32	.30	.32
Acetone, tanks.....lb.	.08	.08½	.08	.10	...	.10
Acetone Oil, bbls NY.....gal.	1.15	1.25	1.15	1.25	1.15	1.25
Acetyl Chloride, 100 lb cby...lb.	.55	.68	.55	.68	.55	.68
Acetylene Tetrachloride (see tetrachlorethane).....						
Acids						
Acid Abietic.....	.12	.12	.12	.12	.12	.12
Acetic, 28% 400 lb bbls c-l wks .....100 lb.	2.65	2.75	2.65	2.75	2.40	2.75
Glacial, bbl c-l wk....100 lb.	....	9.14	...	9.14	8.35	9.14
Glacial, tanks.....	....	8.89	...	8.89	8.10	8.89
Adipic.....	.72	.72	.72	.72	.72	.72
Anthranilic, refd, bbls.....lb.	.85	.95	.85	.95	.85	.95
Technical, bbls.....lb.	.65	.70	.65	.70	.65	.70
Battery, cbys.....100 lb.	1.60	2.25	1.60	2.25	1.60	2.25
Bensoic, tech, 100 lb bbls....lb.	.35	.45	.35	.45	.35	.45
Boric, powd, 250 lb. bbls. .....lb.	.0425	.05	.0425	.05	.0425	.07
Broenner's, bbls.. .....lb.	1.20	1.25	1.20	1.25	1.20	1.25
Butyric, 100% basis cbys....lb.	.80	.85	.80	.85	.80	.85
Camphoric.....lb.	....	5.25	...	5.25	.....	5.25
Chlorosulfonic, 1500 lb drums wks.....lb.	.04½	.05½	.04½	.05½	.04½	.05½
Chromic, 99½%, drs.....lb.	.11½	.12¼	.11½	.12¼	.11½	.14½
Chromotropic, 300 lb bbls....lb.	1.00	1.06	1.00	1.06	1.00	1.06
Citric, USP, crystals, 230 lb. bbls.....lb.	.29	.30	.29	.30	.29	.33½
Cleve's, 250 lb bbls.....lb.	.52	.54	.52	.54	.52	.54
Cresylic, 95%, dark drs NY.gal.	.38	.40	.38	.41	.40	.47
97-99%, pale drs NY.....gal.	.40	.42	.40	.44	.42	.50
Formic, tech 90%, 140 lb. cby.....lb.	.10½	.12	.10½	.12	.10½	.12
Furoic, tech., 100 lb. drums.lb.	....	.35	...	.35	.....	.....
Gallic, tech, bbls.....lb.	.60	.70	.60	.70	.60	.70
USP, bbls.....lb.	....	.74	...	.74	.....	.74
Gamma, 225 lb bbls wks.....fb	.75	77	.75	.77	.75	.80
H, 225 lb bbls wks.....lb.	.60	.65	.60	.65	.60	.65
Hydriodic, USP, 10% soln cby lb.	.50	.51	.50	.51	.59	.67
Hydrobromic, 48%, coml, 155 lb cbys wks.....lb.	.45	.48	.45	.48	.45	.48
Hydrochloric, CP, see Acid Muriatic.....						
Hydrocyanic, cylinders wks .lb.	.80	.90	.80	.90	.80	.90
Hydrofluoric, 30%, 400 lb bbls wks.....lb.	....	.06	...	.06	.....	.06
Hydrofluosilicic, 35%, 400 lb. bbls wks.....lb.	.11	.12	.11	.12	.11	.12
Hypophosphorous, 30%, USP, demijohns .....lb.	.75	.80	.75	.80	.75	.85
Lactic, 22%, dark, 500 lb bbls lb.	.04	.04½	.04	.04½	.04	.04½
44%, light, 500 lb bbls.....lb.	.11½	.12	.11½	.12	.11½	.12
Laurent's, 250 lb bbls.... ...lb.	.36	.42	.36	.42	.36	.42
Linoleic.....lb.	.16	.16	.16	.16	.16	.16
Malic, powd, kegs.....lb.	.45	.60	.45	.60	.45	.60
Metanilic, 250 lb bbls.....lb	.60	.65	.60	.65	.60	.65
Mixed Sulfuric - Nitric..... tanks wks.....N unit	.06½	.07½	.06½	.07½	.07	.07½
tanks wks.....S unit	.008	.01	.008	.01	.008	.01
Monochloroacetic, tech bbl...lb.	.16	.18	.16	.18	.16	.18
Monosulfonic, bbls.....lb.	1.50	1.60	1.50	1.60	1.55	1.70
Muriatic, 18 deg, 120 lb cbys c-l wks.....100 lb.	....	1.35	...	1.35	.....	1.35
tanks, wks.....100 lb.	....	1.00	...	1.00	.....	1.00
20 degrees, cbys wks...100 lb.	....	1.45	...	1.45	.....	1.45
N & W, 250 lb bbls.....	.85	.95	.85	.95	.85	.95
Naphthionic, tech, 250 lb.....	.60	.65	.60	.65	.60	.65
Nitric, 36 deg, 135 lb cbys c-wks. .....100 lb.	....	5.00	...	5.00	.....	5.00
40 deg, 135 lb cbys, c-l wks.....100 lb.	....	6.00	...	6.00	.....	6.00
Oxalic, 300 lb bbls wks NY....lb.	.11	.11½	.11	.11½	.11	.11½
Phosphoric 50%, U. S. P.....lb.	....	.14	...	.14	.....	.14
Syrupy, USP, 70 lb drs....lb.	....	.14	...	.14	.....	.14
Picramic, 300 lb bbls.....lb.	.65	.70	.65	.70	.65	.70
Picric, kegs.....lb.	.30	.50	.30	.50	.30	.50
Pyrogallic, crystals..... .....lb.	1.40	1.45	1.40	1.45	1.45	1.60
Salicylic, tech, 125 lb bbl.....lb.	.33	.37	.33	.37	.33	.37
Sebacic, tech, drum.....lb.	.58	.58	.58	.58	.....	.....
Sulfanilic, 250 lb. bbls.....lb.	....	.15	...	.15	.14½	.16
*Credit of 1c gal on 3 carlots or more.						

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Sulfuric, 66 deg, 180 lb cbys lc-l wks.....100 lb.	1.60	1.95	1.60	1.95	1.60	1.95
tanks, wks, ton	....	15.00	....	15.00	.....	15.00
1500 lb dr wks.....100 lb.	1.50	1.65	1.50	1.65	1.50	1.65
60°, 1500 lb dr wks....100 lb.	1.27½	1.42½	1.27½	1.42½	1.27½	1.42½
Oleum, 20%, 1500 lb. drs lc-l wks.....ton	....	18.50	....	18.50	.....	18.50
40%, lc-l wks net.....ton	....	42.00	....	42.00	.....	42.00
Tannic, tech, 300 lb bbls...lb.	.23	.40	.23	.40	.23	.40
Tartaric, USP, gran. powd, 300 lb bbls.....lb.	.20	.21	.20	.21	.20	.25½
Tobias, 250 lb bbls.....lb.	.75	.80	.75	.80	.75	.85
Trichloroacetic bottles.....lb.	2.00	2.75	2.00	2.75	.....	2.75
Kegs.....lb.	....	1.75	....	1.75	.....	2.00
Tungstic, bbls.....lb.	1.40	1.70	1.40	1.70	1.40	1.70
Albumen, blood, 225 lb bbls...lb.		.43	.35	.43	.35	.40
dark.....bbls., lb.	.10	.17	.10	.17	.10	.20
Egg, edible .....lb.	.76	.78	.74	.80	.75	.90
Technical, 200 lb cases...lb.	.62	.66	.62	.66	.62	.66
Vegetable, edible.....lb.	.65	.70	.60	.70	.60	.65
Technical.....lb.	.50	.55	.50	.55	.50	.55
Alcohol						
Alcohol Butyl, Normal, 50 gal drs c-l wks.....lb.	....	.123	....	.123	.123	.1595
Drums, 1-c-l wks.....lb	....	.128	....	.128	.128	.1645
Tank cars wks.....lb.	....	.113	....	.113	.113	.143
Amyl (from pentane) Tanks wks .....lb.	....	.143	.143	.176	.176	.203
Capryl, tech, drums.....lb.	....	.85	....	.85	.....	.85
Diacetone, tanks.....lb.	.15¾	.16¾	.15¾	.16¾	.....	.....
Ethyl, USP, 190 pf, 50 gal. bbls.....gal.	2.53½	2.65	2.53½	2.65	2.55	2.65
Anhydrous, drums ...gal.	.54	58	.54	.58	.54	.58
No. 5. *188 pf, 50 gal. drs. drums extra.....gal.	....	.385*	....	.385*	.27	.396
No. S. D. 1, tanks .....gal.	....	.304	....	.304	.....	.....
Furfuryl, tech., 500 lb. drs.lb	....	.45	....	.45	.....	.....
Isobutyl, ref., gal. drs.....gal.	....	.75	....	.75	.....	.75
Isopropyl, ref, gal drs.....gal.	.45	.50	.45	.50	.45	.65
Propyl Normal, 50 gal dr..gal.	....	.75	....	.75	.....	.75
Aldehyde Ammonia, 100 gal drlb.	.80	.82	.80	.82	.80	.82
Alpha-Naphthol, crude, 300 lb. bbls.....lb.	.65	.70	.65	.70	.57	.65
Alpha-Naphthylamine, 350 lb. bbls.....lb.	.32	.34	.32	.34	.32	.34
Alum Ammonia, lump, 400 lb bbls, 1-c-l wks.....100 lb.	3.00	3.25	3.00	3.25	3.00	3.25
Chrome, 500 lb casks, wks .....100 lb.	4.50	5.25	4.50	5.25	4.50	5.25
Potash, lump, 400 lb casks wks.....100 lb.	3.00	3.50	3.00	3.50	3.00	3.50
Soda, ground, 400 lb bbls wks.....100 lb.	3.50	3.75	3.50	3.75	3.50	3.75
Aluminum Metal, c-l NY.100 lb.	22.90	24.30	22.00	24.30	22.90	24.30
Chloride Anhydrous .....lb.	.04	.08	.04	.09	.05	.09
Hydrate, 96%, light, 90 lb. bbls.....lb.	.15	.16½	.15	.16½	.15	.17
Stearate, 100 lb bbls.....lb.	.12½	.16	.12½	.17	.15	.21
Sulfate, Iron, free, bags c-l wks.....100 lb.	1.90	1.95	1.90	1.95	1.90	1.95
Coml, bags c-l wks .100 lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminoazobenzene, 110 lb kegs lb.	....	1.15	....	1.15	.....	1.15
Ammonia						
Ammonia anhydrous Com. tanks	....	.05	....	.05	.05	.05½
Ammonia, anhyd. 100 lb cyl...lb.	.15½	.15½	.15½	.15½	.15½	.15½
Water, 26°, 800 lb dr del...lb.	.02½	.03	.02½	.03	.02½	.03
Ammonia, aqua 26° tanks.... NH cont.....	....	.05	.....	.05	.....	.....
Ammonium Acetate .....lb.	.26	.33	.26	.33	.26	.39
Bicarbonate, bbls., f.o.b. plant .....100 lb.	....	5.15	....	5.15	.....	5.15
Bifluoride, 300 lb bbls.....lb.	.14½	.17	.14½	.17	.14½	.22
Carbonate, tech, 500 lb cs..lb.	.08	.12	.08	.12	.08	.12
Chloride, white, 100 lb. bbls wks .....100 lb.	4.45	4.90	4.45	4.90	4.45	5.15
Gray, 250 lb bbls wks...lb.	5.25	5.75	5.25	5.75	5.25	5.75
Lump, 500 lb cks spot...lb.	.10	.11	.10	.11	.10½	.11½
Lactate, 500 lb bbls.....lb.	.15	.16	.15	.16	.15	.16
Linoleate.....lb.	....	.11	....	.11	.11	.15
Nitrate, tech, casks.....lb.	.06	.10	.06	.10	.06	.10
Oleate, drs.....lb.	....	.10	....	.10	.....	.10
Persulfate, 112 lb kegs.....lb.	.20	.22½	.20	.22½	.20	.27½
Phosphate, tech, powd, 325 lb. bbls.....lb.	.08½	.11½	.08½	.11½	.08½	.12
Sulfate, bulk c-l.....100 lb.	1.05	1.15	1.00	1.15	.90	1.40
Sulfocyanide, kegs.....lb.	.36	.48	.36	.48	.36	.48

Prices Current

Amyl Acetate
Cutch

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Amyl Acetate, (from pentane) Tanks del. lb.	....	.13½	...	.13½	.157	.17½
Tech., drs del. lb.	.142	.149	.138	.149	.17½	.18
Amyl Alcohol, see Fusel Oil.						
Furoate, 1 lb tins lb.	.....	5.00	...	5.00	.....	5.00
Aniline Oil, 960 lb drs & tks. lb.	.14½	.16	.14½	.16	.14½	.16
Annatto, fine lb.	.34	.37	.34	.37	.34	.37
Anthraquinone, sublimed, 125 lb. bbls lb.	....	.45	...	.45	.45	.55
Antimony, metal slabs, ton lots lb.	.05½	.06	.05½	.06	.05	.06½
Needle, powd, bbls lb.	.07	.08	.07	.08	.08½	.09
Chloride, soln (butter of) cbys lb.	.13	.17	.13	.17	.13	.17
Oxide, 500 lb bbls lb.	.07½	.08¾	.07½	.08¾	.07½	.08¾
Salt, 63% to 65%, tins lb.	.20	.23	.20	.23	.20	.24
Sulfuret, golden, bbls lb.	.16	.20	.16	.20	.16	.20
Vermillion, bbls lb.	.38	.42	.38	.42	.38	.42
Archil, conc, 600 lb bbls lb.	.20	.21	.20	.21	.17	.21
Double, 600 lb bbls lb	.16	.17	.16	.17	.16	.17
Triple, 600 lb bbls lb.	.16	.17	.16	.17	.16	.17
Argols, 80%, casks lb.	.12	.12½	.12	.13	.12½	.13
Crude, 30%, casks lb.	.06¾	.07¼	.06¾	.07½	.07	.07½
Aroclors, wks lb	.18	.30	.18	.30	.18	.40
Arsenic, Red. 224 lb kegs, cs. lb.	.09¾	.10	.09¾	.10	.09¾	.10
White, 112 lb kegs lb.	.04	.05	.04	.05	.04	.05
Asbestine, c-1 wks ton	13.00	15.00	13.00	15.00	.....	15.00

Barium

Barium Carbonate, precip, 200 lb. bags wks ton	56.50	58.50	56.50	58.50	47.00	57.00
Nat. (witherite) 90% gr. carlots wks bags ton	.....	40.00	.....	.....	.....	.....
Chlorate, 112 lb kegs NY lb.	.13¾	.14¼	.13¾	.14¼	.13¾	.15
Chloride, 600 lb bbl wks ton	63.00	69.00	63.00	69.00	63.00	69.00
Dioxide, 88%, 690 lb drs lb.	.11	.13	.11	.13	.11	.13
Hydrate, 500 lb bbls lb.	.04¼	.05	.04½	.05	.04¾	.05½
Nitrate, 700 lb casks lb.	.....	.07¼	...	.07¼	.07	.08
Barytes, Floated, 350 lb bbls wks ton	22.20	30.50	22.20	30.50	22.00	24.00
Bauxite, bulk, mines ton	5.00	6.00	5.00	6.00	5.00	6.00
Bayberry, bags lb.	.14½	.16	.14½	.16	.....	.....
Beeswax, Yellow, crude bags lb.	.13	.14	.13	.14	.14½	.24
Refined, cases lb.	.20	.21	.20	.21	.20	.28
White, cases lb.	.30	.32	.30	.32	.30	.36
Benzaldehyde, technical, 945 lb. drums wks lb.	.60	.65	.60	.65	.60	.65
Benzene, 90%, Industrial, 8000 gal tanks wks gal.	.....	.22	.20	.22	.....	.20
Ind. Pure, tanks works gal.	.....	.22	.20	.22	.....	.20
Benzidine Base, dry, 250 lb. bbls lb	.65	.67	.65	.67	.65	.67
Benzoyl, Chloride, 500 lb drs lb.	.40	.45	.40	.45	.40	.47
Benzyl Chloride, tech drs lb.	.....	.30	...	.30	.....	.30
Beta-Naphthol, 250 lb bbl wk lb.	.....	.22	...	.22	.....	.22
Naphthylamine, sublimed, 200 lb bbls lb.	1.25	1.35	1.25	1.35	1.25	1.35
Tech, 200 lb bbls lb	.53	.58	.53	.58	.53	.58
Blanc Fixe, 400 lb bbls wks. ton	42.50‡	65.00	42.50	75.00	.....	.....
Bleaching Powder, 800 lb drs c-1 wks contract 100 lb.	1.75	2.00	1.75	2.00	1.75	2.00
Blood, Dried, fob, NY Unit	.....	2.25	1.55	2.25	1.20	1.90
Chicago Unit	.....	1.85	1.15	1.85	1.50	1.60
S. American shipt Unit	1.90	2.00	1.90	2.00	2.00	2.25
Blues, Bronze Chinese Milori Prussian Soluble lb.	.....	.35	...	.35	.....	.35
Bone, raw, Chicago ton	20.00	21.00	19.00	21.00	20.00	22.00
Bone Ash, 100 lb kegs lb.	.06	.07	.06	.07	.06	.07
Black, 200 lb bbls lb.	.05½	.08½	.05½	.08½	.05½	.08½
Meal, 3% & 50%, Imp. ton	18.00	19.00	18.00	21.00	20.00	23.00
Borax, bags lb.	.018	.02	.018	.02	.018	.03¼
Bordeaux, Mixture, 16% pwd. lb.	.11½	.13	.11½	.13	.11½	.13
Paste, bbls lb.	.11½	.13	.11½	.13	.11½	.13
Brazilwood, sticks, shpmt lb.	26.00	28.00	26.00	28.00	26.00	28.00
Bromine, cases lb.	.36	.43	.36	.43	.36	.43
Bronze, Aluminum, powd blk. lb.	.50	.75	.50	.75	.60	1.20
Gold bulk lb.	.40	.55	.40	.55	.55	1.25
Butanes, com 16.32° group 3 tanks lb.	.....	.04	.02¾	.04	.....	.....
Butyl, Acetate, normal drs. lb.	.134	.139	.134	.139	.134	.166
Tank, wks. lb.	.....	.124	.....	.124	.124	.143
Aldehyde, 50 gal drs wks. lb.	.31½	.36	.31½	.36	.31½	.36
Carbitol see Diethylene Glycol Mono (Butyl Ether)	.....	.....	.....	.....	.....	.....
Cellosolve (see Ethylene glycol mono butyl ether)	.....	.....	.....	.....	.....	.....
Furoate, tech., 50 gal. dr. lb.	.....	.50	.....	.50	.....	.50
Propionate, drs lb.	.20	.22	.20	.22	.20	.25
Stearate, 50 gal drs. lb.	.25	.25½	.25	.25½	.25	.25½
Tartrate, drs lb.	.55	.60	.55	.60	.55	.60
Cadmium, Sulfide, boxes lb.	.65	.75	.65	.75	.65	.90
Calcium, Acetate, 150 lb bags c-1 100 lb.	.....	2.50	.....	2.50	2.00	2.50
Arsenate, 100 lb bbls c-1 wks lb.	.05½	.06	.05½	.06	.05½	.06
Carbide, drs lb.	.05	.06	.05	.06	.05	.06
Carbonate, tech, 100 lb bags c-1 lb.	1.00	1.00	1.00	1.00	1.00	1.00
Chloride, Flake, 375 lb drs c-1 wks ton	.....	19.50	19.50	21.00	.....	21.00
Solid, 650 lb drs c-1 fob wks ton	.....	17.50	17.50	18.00	.....	18.00
Calcium Furoate, tech, 100 lb. drums lb.	.....	.30	.....	.30	.....	.30
Nitrate, 100 lb bags ton	24.00	26.00	24.00	26.00	34.00	35.00
Palmitate, bbls lb.	.16	.19	.16	.19	.....	.....

†F. O. B. destination, 1931 prices are works prices.
‡Lowest price is for pulp; highest for high-grade precipitate.
*Argentine grades 1c higher.

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Peroxide, 100 lb drs lb.	.....	1.25	....	1.25	.....	1.25
Phosphate, tech, 450 lb bbls. lb.	.07½	.08	.07½	.08	.07½	.08½
Resinate, precip., bbls lb.	.13	.14	....	....	.....	.....
Stearate, 100 lb. bbls lb.	.12½	.16	.12½	.16	.16	.18
Camphor, slabs lb.	.....	.40	.35½	.42	.....	.....
Powder lb.	.39	.40	.38	.43	.....	.....
Camwood, Bark, ground bbls. lb.	.16	.18	.16	.18	.16	.18
Candelilla Wax, bags lb.	.10	.11	.10	.11	.10	.14
Carbitol, (See Diethylene Glycol Mono Ethyl Ether)	.....	.....	....	...	.....	.....
Carbon, Decolorizing, drums c-1 lb.	.08	.15	.08	.15	.08	.15
Black, 100-300 lb cases 1c-1 NY lb.	.06	.12	.06	.12	.06	.12
Bisulfide, 500 lb drs 1c-1 NY lb.	.05½	.06	.05½	.06	.05½	.06
Dioxide, Liq. 20-25 lb cyl. lb.	..	.06	....	.06	.....	.06
Tetrachloride, 1400 lb drs delivered lb.	.05¼	.06	.05¼	.07	.06½	.07
Carnauba Wax, Flor, bags lb.	.....	.25	.23	.25	.23	.28
No. 1 Yellow, bags lb.	.....	.23	.20	.23	.21	.24
No. 2 N Country, bags lb.	.14	.15	.14	.15	.13	.16
No. 2 Regular, bags lb.	.....	.22	.20	.22	.20	.24
No. 3 N. C. lb.	.....	.16	.11½	.16	.11	.13
No. 3 Chalky lb.	.....	.13½	.12	.13½	.11	.13
Casein, Standard, Domestic ground lb.	.08¾*	.09	.06½	.09	.04¾	.07½
80-100 mesh carlots, bags lb.	.09¼	.10	....	....	.....	.....
Cellosolve (see Ethylene glycol mono ethyl ether)	.....					
Acetate (see Ethylene glycol mono ethyl ether acetate)	..					
Celluloid, Scraps, Ivory cs. lb.	.....	.15	....	.15	.13	.15
Shell, cases lb.	.18	.20	.18	.20	.18	.20
Transparent, cases lb.	.....	.16	....	.16	.....	.15
Cellulose, Acetate, 50 lb kegs. lb.	.80	.90	.80	.90	.80	.90
Chalk, dropped, 175 lb bbls. lb.	.03	.03¾	.03	.03¾	.03	.03¾
Precip, heavy, 560 lb cks. lb.	.02	.03½	.02	.03½	.02	.03½
Light, 250 lb casks lb.	.02½	.03½	.02½	.03½	.02½	.03½
Charcoal, Hardwood, lump, bulk wks bu.	.18	.19	.18	.19	.18	.19
Willow, powd, 100 lb bbl. wks lb.	.06	.06½	.06	.06½	.06	.06½
Wood, powd, 100 lb bbls. lb.	.04	.05	.04	.05	.04	.05
Chestnut, clarified bbls wks. lb.	.01¾	.02	.01½	.02	.01½	.02
25% tks wks lb.	.....	.01½	.012	.01½	.01¾	.02½
Powd, 60%, 100 lb bgs wks. lb.	.....	.04¾	....	.04¾	.....	.04¾
Powd, decolorized bgs wks. lb.	.04½	.05	.04½	.05	.04½	.06
China Clay, lump, blk mines. ton	8.00	9.00	8.00	9.00	8.00	9.00
Powdered, bbls lb.	.....	.01	.02	.01	.02	.02
Pulverized, bbls wks ton	10.00	12.00	10.00	12.00	10.00	12.00
Imported, lump, bulk ton	15.00	25.00	15.00	25.00	15.00	25.00
Chlorine, cyls 1c-1 wks contract lb.	.07	.08½	.07	.08½	.07	.08½
cyls, cl., contract lb.	.....	.05½†	....	.05½	....	.05½
Liq tank or multi-car lot cyls wks contract 100 lb.	.....	1.75	....	1.75	1.55	1.75
Chlorobenzene, Mono, 100 lb. drs 1c-1 wks. lb.	.06	.07½	.06	.07½	.06	.10½
Chloroform, tech, 1000 lb drs. lb.	.15	.16	.15	.16	.15	.16
Chloropicrin, comml cyls. lb.	1.00	1.35	1.00	1.35	1.00	1.35
Chrome, Green, CP lb.	.23	.29	.23	.29	.23	.29
Commercial lb.	.06½	.10	.06½	.10	.06½	.11
Yellow lb.	.14	.15	.14	.15	.14	.18
Chromium, Acetate, 8% Chrome bbls lb.	.05	.05¾	.04¾	.05¾	.04¾	.05¾
20° soln, 400 lb bbls lb.	.....	.05½	....	.05½	.....	.05½
Fluoride, powd, 400 lb bbl. lb.	.27	.28	.27	.28	.27	.28
Oxide, green, bbls lb.	.28	.33	.28	.33	.28	.35½
Coal tar, bbls bbl.	8.00	9.00	8.00	9.00	10.00	10.50
Cobalt Acetate, bbls lb.	.75	80	....	....	.....	.....
Carbonate tech., bbls. lb.	1.34	1.40	....	....	.....	.....
Hydrate, bbls. lb.	1.66	1.76	....	....	.....	.....
Linoleate, paste, bbls. lb.	.39	.40	....	....	.....	.....
Resinate, fused, bbls lb.		12½	....	....	.....	.....
Cobalt Oxide, black, bags lb.	1.15	1.25	1.15	1.25	1.15	1.45
Cochineal, gray or black bag. lb.	.36	.42	.36	.42	.38	.57
Teneriffe silver, bags lb.	.37	.43	.37	.43	.39	.57
Copper, metal, electrol. 100 lb.	6.50	6.75	5.00	6.75	5.05	7.25
Carbonate, 400 lb bbls lb.	.07	.15½	.07	.15½	.07	.16½
Chloride, 250 lb bbls lb.	.17	.18	.17	.18	.17	.25
Cyanide, 100 lb drs lb.	.39	.40	.39	.40	.39	.40
Oleate, precip., bbls lb.	.....	.20	....	....	.....	.....
Oxide, red, 100 lb bbls lb.	.14¾	.15	.14¼	.15	.15	.16
Resinate, precip., bbls lb.	.18	.19	....	....	.....	.....
Stearate, precip., bbls lb.	.35	.40	....	....	.....	.....
Sub-acetate verdigris, 400 lb bbls lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls c-1 wks. 100 lb.	.....	3.25	3.00	3.25	2.75	3.10
Copperas, crys and sugar bulk c-1 wks bags ton	14.00	14.50	14.00	14.50	14.00	14.50
Corn Syrup, 42 deg., bbls. 100 lb.	.....	2.61	....	....	.....	.....
43 deg., bbls. 100 lb.	.....	2.66	....	....	.....	.....
Cotton, Soluble, wet, 100 lb bbls lb.	.40	.42	.40	.42	.40	.42
Cottonseed, S. E. bulk c-1. ton	.....	26.50	....	26.50	.....	26.50
Meal S. E. bulk ton	.....	.....	.....	.....	.....	.....
7% Amm., bags mills. ton	13.25	38.00	13.25	38.00	13.25	38.00
Cream Tartar, USP, 300 lb. bbls lb.	.14½	.15	.14½	.15	.15½	.20½
Creosote, USP, 42 lb cbys. lb.	.40	.42	.40	.42	.40	.42
Oil, Grade 1 tanks gal.	.11	.12	.11	.12	.11	.12½
Grade 2 gal.	.10	.11	.10	.11	.10	.11½
Grade 3 gal.	.09	.11	.09	.11	.09	.11½
Cresol, USP, drums lb.	.10½	.11	.10½	.11	.10½	.11
Crotonaldehyde, 50 gal dr. lb.	.32	.36	.32	.36	.32	.36
Cudbear, English lb.	.16	.17	.16	.17	.16	.17
Cutch, Rangoon, 100 lb bales. lb.	.05½	.07	.05½	.07	.08½	.12
Borneo, Solid, 100 lb bale. lb.	.....	.03¾	.02½	.03¾	.03	.07

Prices Current

Cyanamide
Iron Chloride

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Cyanamide, bags c-1 frt allowed					
Ammonia unit	.97½	....	.97½	....	.97½
Dextrin, corn, 140 lb bags	100 lb. 3.29	3.49	2.89	3.49	2.99	3.67
White, 140 lb bags	100 lb. 3.24	3.44	2.94	3.44	2.94	3.37
Potato Yellow, 220 lb bgs	lb. .07¾	.08¾	.07¾	.09	.08	.09
White, 220 lb bags 1c-1	lb. .08	.09	.08	.09	.08	.09
Tapioca, 200 lb bags 1c-1	lb. .06¾	.07¾	.06¾	.08	.07	.08¾
Diamylether, wks., drums	lb.	.60	....	....	....	....
Diamylphthalate, drs wks	gal.	.20½	....	....	....	....
Dianisidine, barrels	lb. 2.35	2.70	2.35	2.70	2.35	2.70
Dibutylphthalate, wks	lb. .20½	.21	.20½	.22	.218	.23½
Dibutyltartrate, 50 gal drs	lb. .29½	.31½	.29½	.21	.29½	.31½
Dichloroethylether, 50 gal drs	lb.	.16	....	.16	....	.16
Dichloromethane, drs wks	lb. .55	.65	.55	.65	.55	.65
Diethylamine, 400 lb drs	lb. 2.75	3.00	2.75	3.00	2.75	3.00
Diethylcarbonate, com. drs.	gal.	.31¾	....	....	....	....
Diethylaniline, 850 lb drs	lb. .52	.55	.52	.55	.55	.60
Diethyleneglycol, drs	lb. .14	.16	.14	.16	.14	.16
Mono ethyl ether, drs	lb. .15	.16	.15	.16	.15	.16
Mono butyl ether, drs	lb.	.26	....	.26	.24	.30
Diethylene oxide, 50 gal drs	lb. .26	.27	.26	.27	....	....
Diethylorthotoluidin, drs	lb. .64	.67	.64	.67	.64	.67
Diethyl phthalate, 1000 lb. drums	lb.	.20	.20	.26	.23	.26
Diethylsulfate, technical, 50 gal drums	lb.	....	....	....	.30	.35
Digtycol Oleate, bbls	lb.	.16	....	....	....	....
Dimethylamine, 400 lb drs, pure 25 & 40% sol. 100% basis	lb.	1.20	....	....	....	....
Dimethylaniline, 340 lb drs	lb. .25	.27	.25	.27	.25	.27
Dimethyl phthalate drs	lb.	.24½	....	....	....	....
Dimethylsulfate, 100 lb drs	lb. .45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls	lb.	.18	....	.18	.15	.16
Dintrochlorobenzene, 400 lb bbls	lb. .13	.15	.13	.15	.13	.15
Dinitronaphthalene, 350 lb bbls	lb. .34	.37	.34	.37	.34	.37
Dinitrophenol, 350 lb bbls	lb. .23	.24	.23	.24	.23	.24
Dinitrotoluene, 300 lb bbls	lb. .15	.16	.15	.17	.16	.17
Dioxan (See Diethylene Oxide)	....	....	....	....	....	....
Diphenyl	lb. .15	.25	.15	.40	.20	.40
Diphenylamine	lb. .31	.34	.31	.34	.34	.37
Diphenylguanidine, 100 lb bbl	lb. .30	.35	.30	.35	.30	.35
Dip Oil, 25%, drums	lb. .23	.25	.23	.25	.26	.30
Divi Divi pods, bgs shipmt	ton 28.00	29.00	26.00	29.00	26.00	30.00
Extract	lb. .05	.05½	.05	.05½	.05	.05½
Egg Yolk, 200 lb cases	lb. .41	.43	.40	.43	.40	.52
Epsom Salt, tech, 300 lb bbls c-1 NY	100 lb.	2.20	....	2.20	1.70	1.90
Ether, USP anaesthesia 55 lb. drs.	lb. .22	.23	.22	.23	.22	.23
(Cone)	lb. .09	.10	.09	.10	.09	.10
Isopropyl 50 gal. drums	lb. .07‡	.08	.07	.08	....	....
Synthetic, wks, drums	lb. .08	.09	....	....	....	....
Ethyl Acetate, 85% Ester tanks	lb. .07½	.08	.07½	.09	.08½	.09
drums	lb. .08½	.09	.08½	.10	.09½	.10
Anhydrous, tanks	lb. .09	.10	.09	.10	....	.10
drums	lb. .10	.10½	.10	.10½	....	.10½
Acetoacetate, 50 gal drs	lb. .65	.68	.65	.68	.65	.68
Benzylaniline, 300 lb drs	lb. .88	.90	.88	.90	.88	.90
Bromide, tech, drums	lb. .50	.55	.50	.55	.50	.55
Carbonate, 90%, 50 gal drs	gal. 1.85	1.90	1.85	1.90	1.85	1.90
Chloride, 200 lb drums	lb.	.22	....	.22	....	.22
Chlorocarbonate, cbys	lb.	.30	....	.30	....	.30
Ether, Absolute, 50 gal drs	lb. .50	.52	.50	.52	.50	.52
Furoate, 1 lb tins	lb.	5.00	....	5.00	....	5.00
Lactate, drums works	lb. .25	.29	.25	.29	.25	.29
Methyl Ketone, 50 gal drs	lb.	.30	....	.30	....	.30
Oxalate, drums works	lb. .37½	.55	.37½	.55	.37½	.55
Oxybutyrate, 50 gal drs wks	lb. .30	.30½	.30	.30½	....	.30½
Ethylene Dibromide, 60 lb dr.	lb. .65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys. chloro, cont	lb. .75	.85	.75	.85	.7	.85
Dichloride, 50 gal drums	lb. .05	.09	.05	.09	.0595	.07
Glycol, 50 gal drs wks	lb. .25	.28	.25	.28	.25	.28
Mono Butyl Ether drs wks	....	.20	....	.20	.20	.24
Mono Ethyl Ether drs wks	.15	.17	.15	.17	.15	.20
Mono Ethyl Ether Acetate dr. wks	.16½	.18	.16½	.18	.16½	.23
Mono Methyl Ether, drs	lb. .21	.23	.21	.23	.21	.23
Stearate	.18	.18	.18	.18	.18	.18
Oxide, cyl	lb.	.75	....	.75	.75	2.00
Ethylidenaniline	lb. .45	.47½	.45	.47½	.45	.47½
Feldspar, bulk	ton 15.00	20.00	15.00	20.00	15.00	20.00
Powdered, bulk works	ton 15.00	21.00	15.00	21.00	15.00	21.00
Ferric Chloride, tech, crystal 475 lb bbls	.04½	.07	.04½	.07	.04½	.07½
Fish Scrap, dried, wks	unit	1.85*	....	1.85*	1.60	3.00
Acid, Bulk 7 & 3½% delivered Norfolk & Balt. basis	unit	2.00†	1.85	2.00†	1.40	2.40
Fluorspar, 98%, bags	28.00	35.50	28.00	35.50	28.00	46.00

*& 10; †& 50

Formaldehyde

Formaldehyde, aniline, 100 lb	....	....	....	....	....	....
drums	lb. .37½	.42	.37½	.42	.37½	.42
USP, 400 lb bbls wks	lb. .06	.07	.06	.07	.06	.07½
Fossil Flour	lb. .02½	.04	.02½	.04	.02½	.04
Fullers Earth, bulk, mines	ton 15.00	20.00	15.00	20.00	15.00	20.00
Imp. powd c-1 bags	ton 24.00	30.00	24.00	30.00	24.00	30.00
Furfural (tech.) drums wks,	lb. .10§	.15	.10	.15	....	.10
Furfuramide (tech) 100 lb dr.	lb.	.30	....	.30	....	.30
Furfuryl Acetate, 1 lb tins	lb.	5.00	....	5.00	....	5.00
Fusel Oil, 10% impurities	lb.	.14½	....	.14½	....	....
Fustic, chips	lb. .04	.05	.04	.05	.04	.05
Crystals, 100 lb boxes	lb. .18	.20	.18	.20	.18	.20
Liquid 50°, 600 lb bbls	lb.	.08	.07	.08	.07	.08

‡Higher price, refined. §Tanks, 1c lower.

Solid, 50 lb boxes	lb. .14	.16	.14	.16	.14	.16
Sticks	ton 25.00	26.00	25.00	26.00	25.00	26.00
G Salt paste, 360 lb bbls	lb. .42	.43	.42	.43	.42	.50
Gall Extract	lb. .18	.20	.18	.20	.18	.20
Gambier, common 200 lb cs.	lb. .03½	.06½	.03	.07	.06½	.07
Singapore cubes, 150 lb bg.	lb. .05¼	.06½	.05¼	.07	.07½	.09
Gelatin, tech, 100 lb cases	lb. .45	.50	.45	.50	.45	.50
Glauber's Salt, tech, c-1 wks.	100 lb. 1.00	1.70	1.00	1.70	1.00	1.70
Glucose (grape sugar) dry 70-80° bags c-1 NY	100 lb. 3.24	3.34	3.24	3.34	3.24	3.34
Tanner's Special, 100 lb bags	100 lb.	2.33	....	2.33	2.36	2.75
Glue, medium white, bbls	lb. .12	.13	.12	.13	.15½	.20
Pure white, bbls	lb. .18	.20	.18	.20	.18	.27
Glycerin, CP, 550 lb drs	lb.	.10½	....	.10½	.09¾	.11½
Dynamite, 100 lb drs	lb. .08½	.08½	.07½	.08½	.07½	.09¾
Saponification, tanks	lb.	.05	....	.05	.04½	.06½
Soap Lye, tanks	lb. .04½	.04¼	.04	.04¼	.03¾	.05
Glyceryl Stearate, bbls	lb.	.17	....	.17	....	.17
Graphite, crude, 220 lb bgs	ton 12.00	23.00	12.00	23.00	12.00	35.00
Flake, 500 lb bbls	lb. .05	.06	.05	.06	.05	.09

Gums

Gum Accroides, Red, coarse and fine 140-150 lb bags	lb. .03¾	.04½	.03¾	.04½	.03¾	.04½
Powd, 150 lb bags	lb. .06	.06½	.06	.06½	.06	.06½
Yellow, 150-200 lb bags	lb. .18	.20	.18	.20	.18	.20
Animi (Zanzibar) bean & pea 250 lb cases	lb. .35	.40	.35	.40	.35	.40
Glassy, 250 lb cases	lb. .50	.55	.50	.55	.50	.55
Arabic, amber sorts	lb. .06	.06½	.05¾	.06½	....	....
Asphaltum, Barbadoes (Manjak) 200 lb bags	lb. .04	.05	.04	.05	.04	.06
Egyptian, 200 lb cases	lb. .13	.15	.13	.15	.13	.15
Gamboge, pipe, cases	lb. .50	.55	.42	.55	....	....
Powdered, bbls	lb. .60	.65	.50	.65	....	....
Gilsonite Selects, 200 lb bags	ton 30.50	32.90	30.50	32.90	30.50	32.90
Damar Batavia standard 136, lb. cases	lb. .08½	.09½	.08½	.09½	.08½	.09
Batavia Dust, 160 lb bags	lb. .04	.05	.04	.05	.04	.05½
E Seeds, 136 lb cases	lb. .05½	.06	.05½	.06	.05½	.06½
F Splinters, 136 lb cases and bags	lb. .05½	.06	.05½	.06	.05½	.06
Singapore, No. 1, 224 lb cases	lb. .09½	.10	.09½	.10	.10½	.11
No. 2, 224 lb cases	lb.	.07	....	.07	.06	.07½
No. 3, 180 lb bags	lb. .04½	.05	.04½	.05	.04½	.05
Benzoin Sumatra, U. S. P. 120 lb. cases	lb. .17	.18	.17	.20	.18	.22
Copal Congo, 112 lb bags, clean opaque	lb. .16½	.17	.16½	.17	.16½	.17
Dark, amber	lb. .06	.07	.06	.07	.06	.07
Light, amber	lb. .08	.08½	.08	.08½	.08	.09
Water, white	lb. .37	.45	.37	.45	.37	.45
Kino, tins	lb. .48	.50	....	....	....	....
Mastic	lb. .28½	.28½	.26½	.28½	.26½	.40
Manila 180-190 lb baskets						
Loba A	lb. .09	.10	.09	.10	.09	.11
Loba B	lb. .08	.08½	.08	.08½	.08	.08½
Loba C	lb. .07	.08	.07	.08	.07	.08
M A Sorts	lb. .05	.05½	.05	.05½	.04½	.05
D B B Chips	lb. .05¾	.06	.05¾	.06	.05	.06½
East Indies chips, 180 lb bags	lb. .04½	.05	.04½	.05	.04½	.05½
Pale bold, 224 lb cs.	lb. .05½	.06	.05½	.06	.06	.08
Pale nubs, 180 lb bags	lb. .03	.04	.03	.04	.03½	.05
Pontianak, 224 lb cases						
Bold gen No. 1	lb. .14	.15	.14	.15	.14	.16
Gen. chips spot	lb. .05	.06	.05	.07	.05	.08
Elemi, No. 1, 80-85 lb cs.	lb. .09½	.10	.09	.10	.09	.09¾
No. 2, 80-85 lb cases	lb. .09	.10	.08½	.10	.08½	.09
No. 3, 80-85 lb cases	lb. .08	.08½	.08½	.08	.08½	.08½
Kauri, 224-226 lb cases No. 1	lb. .20	.25	.20	.25	.20	.42
No. 2 fair pale	lb. .12½	.16	.12½	.16	.12½	.30
Brown Chips, 224-226 lb. cases	lb. .10	.12	.10	.12	.10	.12
Bush Chips, 224-226 lb. cases	lb. .22	.24	.22	.24	.22	.24
Pale Chips, 224-226 lb cases	lb. .11	.14	.11	.14	.11	.14
Sandarac, prime quality, 200 lb bags & 300 lb casks	lb. .22½	.23	.21	.23½	.23	.25½
Tragacanth, No. 1 bags	lb. .65	.70	.65	.75	....	....
Helium, 1 lit. bot.	lit.	....	25.00	....	25.00	....	25.00
Hematine crystals, 400 lb bbls	lb. .10	.18	.10	.18	.10	.18
Paste, 500 bbls	lb.	.11	....	.11	....	.11
Hemlock 25%, 600 lb bbls wks	lb. .03½	.04½	.03½	.04½	.03	.04½
Bark	ton	16.00	....	16.00	....	16.00
Hexalene, 50 gal drs wks	lb.	.30	....	.30	.30	.40
Hexamethylenetetramine, drs	lb. .46	.47	.46	.47	.46	.47
Hoof Meal, f.o.b. Chicago	unit .90	1.00	.75	1.00	.75	1.35
South Amer. to arrive	unit 1.40	1.50	1.40	1.50	1.25	1.65
Hydrogen Peroxide, 100 vol, 140 lb cbys	lb. .20	.21	.20	.21	.20	.21
Hydroxyamine Hydrochloride	lb.	3.15	....	3.15	....	3.15
Hypernic, 51°, 600 lb bbls	lb. .11	.12	.11	.12	.11	.12

Indigo

Indigo Madras, bbls	lb. 1.25	1.30	1.25	1.30	1.25	1.30
20% paste, drums	lb. .15	.18	.15	.18	.15	.18
Synthetic, liquid	lb.	.12	....	.12	....	.12
Iodine, crude	per kilo.	£1 5s	....	....	....	....
Resublimed, kegs	lb. 2.65	2.70	....	....	....	....
Irish Moss, ord. bales	lb. .05	.06	....	....	....	....
Bleached, prime, bales	lb. .07	.08	....	....	....	....
Iron Chloride. see Ferric or Ferrous						

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Iron Nitrate, kegs lb.	.09	.10	.09	.10	.09	10
Coml, bbls 100 lb.	2.50	3.25	2.50	3.25	2.50	3.25
Oxide, English lb.	.04	.10	.04	.10	.04	.10
Japan Wax, 224 lb cases lb.		.06¼	.05½	.06¼	.06	.09
Kieselguhr, 95 lb bgs NY						
Brown ton	60.00	70.00	60.00	70.00	60.00	70 00
Lead Acetate, bbls wks 100 lb.	8.50	9.00	8.50	9.50	9.00	10.00
White crystals, 500 lb bbls wks 100 lb.	9.50	10.00	9.50	10.50	10.00	11.00
Arsenate, drs 1c-l wks lb.	.09	.10½	.09	.10½	.09½	.13
Dithiofuroate, 100 lb dr lb.		1.00	....	1.00	.....	1.00
Metal, c-1 NY 100 lb.		3.50	3.00	3.50	2.70	3.75
Nitrate, 500 lb bbls wks lb.	.10½	.14	.10½	.14	.10½	.14
Oleate, bbls lb.	.15	.16	.15	.16	.15	.18
Lead Oxide Litharge, 500 lb. bbls lb.		.06	.05½	.06	.05½	.07
Oleate, bbls lb.		.15	....	....	.....	.....
Red, 500 lb bbls wks lb.		.07	.06½	.07	.06½	.07
Resinate, precip., bbls lb.	.18	.18½	....	....	.....	.....
Stearate, bbls lb.	.22	.23	....	....	.....	.....
White, 500 lb bbls wks lb.	.06	.07	.06	.07	.06	.07
Sulfate, 500 lb bbls wk lb.		.06	.05½	.06	.05½	.06
Leuna saltpetre, bags c.i f ton		Nom.	....	Nom	.....	Nom.
S. points c.i f ton		Nom.	....	Nom.	.....	Nom.
Lime, ground stone bags ton		4.50	....	4.50	.....	4.50
Live, 325 lb bbls wks 100 lb.		1.05	....	1.05	.....	1.05
Lime Salts, see Calcium Salts						
Lime-Sulfur soln bbls gal.	.15	.17	.15	.17	.15	.17
Linseed cake, bulk ton		18.75	17.50	19.50	.....	.....
Linseed Meal ton		29.50	....	....	.....	.....
Lithopone, 400 lb bbls 1c-1 wks lb.	.04½	.05	.04½	.05	.04½	.05
Logwood, 51°, 600 lb bbls lb.	05	.08	.05	.08	.05	.08
Chips, 150 lb bags lb.	.03	.03½	.03	.03½	.03	.03½
Solid, 50 lb boxes lb.	.08	12½	.08	.12½	.08	.12½
Sticks ton	24.00	26.00	24.00	26.00	24.00	26.00
Madder, Dutch lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbl ton	46.00	56.00	46.00	56.00	50.00	60.00
Magnesium Carb, tech, 70 lb. bags NY lb.	.05½	.06½	.05½	.06½	.05½	.06½
Chloride flake, 375 lb. drs c-1 wks ton	34.00	36.00	34.00	36.00	35.00	36.00
Imported shipment ton	31.75	33.00	31.75	33.00	31.75	33.00
Fused, imp., 900 lb bbls NY ton		31.00	....	31.00	.....	31.00
Fluosilicate, crys, 400 lb bbls wks lb.	.10	10½	.10	.10½	.10	.10½
Oxide, USP, light, 100 lb bbls lb.		.42	....	.42	.....	.42
Heavy, 250 lb bbls lb.		.50	....	.50	.....	.50
Palmitate, bbls lb.	.19	.23	....	....	.....	.....
Peroxide, 100 lb cs lb.	1.00	1.25	1.00	1.25	1.00	1.25
Silicofluoride, bbls lb.	.09½	.10½	.09½	.10½	.09½	.10½
Stearate, bbls lb.	.16½	.17	.16½	.17	.16½	.26
Manganese Borate, 30%, 200 lb bbls lb.	.15	.16	.15	.16	.15	.19
Chloride, 600 lb casks lb.	.07	.08	.07	.08	.07	.08½
Dioxide, tech (peroxide) drs lb.	.03½	.06	.03½	.06	.03½	.06
Linoleate, lig. drums lb.	.18	.19	....	....	.....	.....
Resinate, fused, bbls lb.	.08½	.08½	....	....	.....	.....
precip., bbls lb.	.11½	12½	....	....	.....	.....
Sulfate, 550 lb drs NY lb.	.07	.08	.07	.08	.07	.08
Mangrove 55%, 400 lb bbls lb.		.04	....	.04	.....	.04
Bark, African ton	26.00	27.00	22.00	27.00	21.00	25.00
Marble Flour, bulk ton	12.00	13.00	12.00	13.00	12.00	15.00
Mercurous chloride lb.	.67	.72	.67	.72	.67	.93
Mercury metal 76 lb flask		55.50	48.00	55.50	47.00	74.50
Meta-nitro-aniline lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-para-toluidine 200 lb. bbls lb.	1.40	1.55	1.40	1.55	1.40	1.55
Meta-phenylene-diamine 300 lb. bbls lb.	.80	.84	.80	.84	.80	.84
Meta-toluene-diamine, 300 lb bbls lb.	.67	.69	.67	.69	.67	.69
Methanol, (Wood Alcohol)						
*Crude, tanks gal.		.20	.20	.20	.....	.....
95% tanks gal.	.33	.35	.33	.35	.33	.35
97% tanks gal.	.34	.39	.34	.39	.34	.39
*Pure, Synthetic drums cars gal.		.39½	.37½	.39½	.37½	.41½
*Synthetic tanks gal.		.35½	....	.35½	.....	.35½
*Denat. grade, tanks gal.		.37	.35	.37	.....	.....
Methyl Acetate drums 82% gal.	.12	.13	.12	.13	.12	.17½
99% gal.		.15	....	.15	.....	.15
Acetone, drums gal.	.45	.47	.45	.49	.47	.55
Hexyl Ketone, pure lb.		1.20	....	1.20	.....	1.20
Anthraquinone lb.	.65	.67	.65	.67	.65	95
Cellosolve, (See Ethylene Glycol Mono Methyl Ether)		.....	....	....	.....	.....
Chloride, 90 lb cyl lb.	.45	.45	.45	.45	45	.45
Furoate, tech., 50 gal. dr lb.		.50	....	.50	.....	50
Mica, dry grd. bags wks lb.	65.00	80.00	65.00	80.00	65.00	80.00
Michler's Ketone, kegs lb.		3.00	....	3.00	.....	3 00
Molasses, blackstrap, tanks f.o.b. N. Y gal.		.05	.05	.05	.....	.....
Monochlorobenzene, drums see, Chlorobenzene, mono lb.						
Monomethylparaminosulfate 100 lb drums lb.	3.75	4.00	3.75	4.00	3.75	4.00
Montan Wax, crude, bags lb.		.04½	.03¾	.04½	.03¾	.07
Myrobalans 25%, liq bbls lb.	.03¾	.04½	.03¾	.04½	.03¾	.04½
50% Solid, 50 lb boxes lb.	.05	.05½	.05	.05½	.05	.05½
J1 bags ton	27.00	28.00	27.00	35.00	34.00	35.00
J2 bags ton		16.75	15.50	16.75	15.25	18.50
R2 bags ton		16.50	15.00	16.50	14.75	17.50
Naphtha, v.m.& p. (deodorized) tanks gal.	.08½	.09	.08½	.09	.08½	.10
Naphthalene balls, 250 lb bbls wks lb.		.05½	....	.05½	.03¾	05½
Crushed, chipped bgs wks lb.		.04½	....	.04½	.....	.04½
Flakes, 175 lb bbls wks lb.		.04¾	....	.04¾	.03¾	.04¾
*delivered basis (east of Miss. River)						

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Nickel Chloride, bbls lb.	.17	.18	.17	.18	.18	.20
Oxide, 100 lb kegs NY lb.	.35	.37	.35	.37	.35	.40
Salt bbl. 400 bbls lb NY lb.	.11	.13	.11	.13	.10½	.13
Single, 400 lb bbls NY lb.	.11	.12	.11	.12	.10½	.12
Metal ingot lb.	.35	.35	.35	.35	.35	.35
Nicotine, free 40%, 8 lb tins, cases lb.	1.05	1.30	1.05	1.30	1.25	1.30
Sulfate, 55 lb. drums lb.	.74½	.86	.74½	.86	.74½	.....
Nitre Cake, bulk ton	10.00	12.00	10.00	12.00	10.00	12.00
Nitrobenzene, redistilled, 1000 lb drs wks lb.	.09	.09½	.09	.09½	.09	.09½
Nitrocellulose, c-l-l-cl, wks lb.	.27	.33	.27	.33	25	.36
Nitrogenous Material, bulk unit		1.80	1.50	1.80	1.35	1.55
Nitronaphthalene, 550 lb bbls lb.		.25	....	.25	....	25
Nitrotoluene, 1000 lb drs wks lb.	.14	.15	.14	.15	.14	.15
Nutgalls Aleppy, bags lb.		.18	....	.18	.....	.18
Chinese, bags lb.	.17	.18	.17	.18	.17	.18
Oak Bark, ground ton	30.00	35.00	30.00	35.00	30.00	35.00
Whole ton	20.00	23.00	20.00	23.00	20.00	23.00
Orange-Mineral, 1100 lb casks NY lb.		.10¾	.10¼	.10¾	.09½	.10¾
Orthoaminophenol, 50 lb kgs lb	2.15	2.25	2.15	2.25	2 1	2.25
Orthoanisidine, 100 lb drs lb.	1.00	1.15	1.00	1.15	1.15	1.50
Orthochlorophenol, drums lb.	.50	.65	.50	.65	.50	.65
Orthocresol, drums lb.	.13	.15	.13	.15	.13	.22
Orthodichlorobenzene, 1000 lb. drums lb.	.07	.10	.07	.10	.07	.10
Orthonitrochlorobenzene, 1200 lb drs wks lb.	.28	.29	.28	.29	28	29
Orthonitrotoluene, 1000 lb drs wk lb.	.14	.16	.14	.16	.14	.18
Orthonitrophenol, 350 lb dr lb.	.85	.90	.85	.90	85	.90
Orthotoluidine, 350 lb bbl 1c-1 lb.	.20	.22	.20	.22	.20	22
Orthonitroparachlorphenol, tins lb.	.70	.75	.70	.75	.70	.75
Osage Orange, crystals lb.	.16	.17	.16	.17	.16	.17
51 deg. liquid lb.	.06	.06½	.06	.06½	.06	.07½
Powdered, 100 lb bags lb.	.14½	.15	.14½	.15	14½	.15
Paraffin, refd, 200 lb cs slabs 123-127 deg. M. P lb.		.02½	.02	.02½	.02½	.03
128-132 deg. M. P lb.	.03½	.03½	.03½	.03½	.....	.03½
133-137 deg. M. P lb.	.043	.04½	.043	.04½	.04	.04½
Para Aldehyde, 110-55 gal drs lb.	.20½	.23	.20½	.23	.20½	.23
Aminoacetanilid, 100 lb bg lb.	.52	.60	.52	.60	.52	.60
Aminohydrochloride, 100 lb. kegs lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kegs lb.	.78	.80	.78	.80	.78	.80
Chlorophenol, drums lb.	.50	.65	.50	.65	.50	.65
Coumarone, 330 lb drums lb.		.....	....	.....	.....	.....
Cymene, refd, 110 gal dr gal.	2.25	2.50	2.25	2.50	2.25	2.50
Dichlorobenzene, 150 lb bbls wks lb.	.15½	.16	.15½	.16	.15½	.16
Nitroacetanilid, 300 lb bbls lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls wks lb.	.48	.55	.48	.55	.48	.55
Nitrochlorobenzene, 1200 lb drs wks lb.	.23	.26	.23	.26	.23	.26
Nitro-orthotoluidine, 300 lb. bbls lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol 185 lb bbls lb.	.45	.50	.45	.50	.45	.50
Nitrosodimethylaniline, 120 lb. bbls lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	.29	.31	.29	.31	.29	.31
Phenylenediamine, 350 lb bbls lb.	1.15	1.20	1.15	1.20	1.15	1.20
Toluenesulfonamide, 175 lb bbls lb.	.70	.75	.70	.75	.70	.75
Toluenesulfonchloride, 410 lb bbls wks lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls wk lb.		.58	....	.58	.42	.43
Paris Green, Arsenic Basis 100 lb kegs lb.		.24	....	.24	.24	.27
250 lb kegs lb.		.23	....	.23	.23	.25
Persian Berry Ext., bbls lb.	.25	Nom	.25	Nom	.25	Nom.
Pentane, normal, 28-38° C, group 3, tanks gal.		.07	....	....	.....	.....
Pentasol (see Alcohol, Amyl)						
Pentasol Acetate (see Amyl Acetate)						
Petrolatum, Green, 300l b bbl. lb.	.01⅞	.02	.01⅞	.02	.02	.02½
Petroleum Ethers, tanks 30-60°, Group 3 gal.		.10	....	.10	.....	.....
Petroleum solvents and diluents						
Cleaners' naphtha, Group 3, tanks gal.	.05½	.06½	.05½	.06½	.....	.....
Lacquer diluents, Bayonne tanks gal.	.12	.12½	.12	.12½	.....	.....
Group 3, tanks gal.	.06½	.07¼	.06½	.08	.....	.....
Petroleum thinner 47-49 deg. tanks gal.		.08½	....	.08½	.....	.....
Rubber solvent, stand. grade tanks gal.	.05½	.05½	.05½	.06	.....	.....
Stoddard solvents 48-50 deg. tanks gal.	.04¾	.05	.04¾	.05½	.....	.....
Phenol, 250-100 lb drums lb.	.14½	.15	.14½	.15	.14½	.15
Phenyl-Alpha-Naphthylamine, 100 lb kegs lb.		1.35	....	1.35	....	1.35
Phenyl Chloride, drums lb.		.16	....	....	.....	.....
Phenylhydrazine Hydrochloride lb.	2.90	3.00	2.90	3.00	2.90	3.00
Phosphate Acid (see Superphosphate)						
Phosphate Rock, f.o.b. mines						
Florida Pebble, 68% basis ton	3.10	3.25	3.10	3.25	3.10	3.25
70% basis ton	3.75	3.90	3.75	3.90	3.75	3.90
72% basis ton	4.25	4.35	4.25	4.35	4.25	4.35
75-74% basis ton	5.25	5.50	5.25	5.50	5.25	5.50
75% basis ton		5.75	....	5.75	.....	5.75
77-80% basis ton		6.25	....	6.25	.....	6.25
Tennessee, 72% basis ton		5.00	....	5.00	.....	5.00

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Phosphorous Oxychloride 175 lb cyl.....lb.	.18	.20	.18	.20	.18	.20
Red, 110 lb cases.....lb.	.40	.45	.40	.45	.40	.46
Yellow, 110 lb cases wks.lb.	.27½	.32	.27½	.32	.27½	.37½
Sesquisulfide, 100 lb cs.....lb.	.38	.44	.38	.44	.38	.44
Trichloride, cylinders.....lb.	.18	.20	.18	.20	.18	.20
Phthalic Anhydride, 100 lb bbls wks.....lb.	.15	.16	.15	.16	.15	.16
Pigments Metallic, Red or brown bags, bbls, Pa. wks.....ton	37.00	45.00	37.00	45.00	37.00	45.00
Pine Oil, 55 gal drums or bbls Destructive dist.....lb.	.59	.62	.59	.62	.59	.63
Prime bbls.....bbl.	8.00	10.60	8.00	10.60	8.00	10.60
Steam dist. bbls.....gal.	.52	.54	.52	.54	.54	.61
Pitch Hardwood..... wks.....ton	.....	20.00	20.00	25.00	20.00	35.00
Plaster Paris, tech, 250 lb bbls .....bbl.	3.40	3.50	3.30	3.50	3.30	3.50
Platinum, Refined.....oz.	24.00	26.00	24.00	26.00	32.00	38.00
Pontol, tanks.....per gal.	.....	.54	....	.54	.54	.54
Potash, Caustic, wks, solid...lb.	.06½	.06¾	.06½	.06½	.06½	.06½
flake.....lb.	.0705	.08	.0705	.08	.0705	.08
Potash Salts, Rough Kainit 12.4% basis bulk.....ton	.....	9.20	....	9.20	.....	9.20
14% basis.....ton	.....	9.70	....	9.70	.....	9.70
Manure Salts..... 20% basis bulk.....ton	.....	12.00	....	12.00	12.00	12.65
30% basis bulk.....ton	.....	19.15	....	19.15	.....	19.15
Potassium Acetate.....lb.	.27	.28	.27	.28	.27	.28
Potassium Muriate, 80% basis bags.....ton	.....	37.15	....	37.15	.....	37.15
Pot. & Mag. Sulfate, 48% basis bags.....ton	.....	27.80	....	27.80	.....	27.80
Potassium Sulfate, 90% basis bags.....ton.	....	47.50	....	47.50	47.50	48.25
Potassium Bicarbonate, USP, 320 lb bbls.....lb.	.07½	.09	.07½	.09	.07½	.09
Bichromate Crystals, 725 lb casks.....lb.	.07¼	.08	.07¼	.08	.07	.08½
Binoxalate, 300 lb bbls.....lb.	.14	.17	.14	.17	.14	.17
Bisulfate, 100 lb kegs.....lb.	.16	.30	.16	.30	.16	.30
Carbonate, 80-85% calc. 800 lb casks.....lb.	.....	.05¾	.04¾	.05¾	.0475	.05
Chlorate crystals, powder 112 lb keg wks.....lb.	.08	.08½	.08	.08½	.08	.08½
Chloride, crys bbls.....lb.	.04	.04½	.04	.04½	.04	.04½
Chromate, kegs.....lb.	.23	.28	.23	.28	.23	.28
Cyanide, 110 lb. cases.....lb.	.50	.57½	.50	.57½	.50	.57½
Metabisulfite, 300 lb. bbl...lb.	.10½	.11	.10½	.11	.10½	.13
Oxalate, bbls.....lb.	.16	.24	.16	.24	.16	.24
Perchlorate, casks wks.....lb.	.09	.11	.09	.11	.09	.11
Permanganate, USP, crys 500 & 100 lb drs wks.....lb.	.16	.16½	.16	.16½	.16	.16½
Prussiate, red, 112 lb keg...lb.	.32½	.34½	.32½	.38½	.....	.38½
Yellow, 500 lb casks.....lb.	.16½	.17	.16½	.17	.16½	.21
Tartrate Neut, 100 lb keg...lb.	.....	.21	....	.21	.....	.21
Titanium Oxalate, 200 lb bbls .....lb.	.21	.23	.21	.23	.21	.23
Propane, group 3, tanks.....	.....	.07	....	.07	.....	.....
Propyl Furoate, 1 lb tins.....lb.	.....	5.00	....	5.00	.....	5.00
Pumice Stone, lump bags.....lb.	.04	.05	.04	.05	.04	.05
250 lb bbls.....lb.	.04½	.06	.04½	.06	.04½	.06
Powdered, 350 lb bags.....lb.	.02½	.03	.02½	.03	.02½	.03
Putty, commercial, tubs..100 lb.	2.00	2.25	2.00	2.25	2.00	2.45
Linseed Oil, kegs.....100 lb.	3.40	3.50	3.40	3.50	3.40	4.75
Pyridine, 50 gal drums .....gal.	.85	.95	.85	.95	.85	1.25
Pyrites, Spanish cif Atlantic ports bulk.....unit	.12	.13	.12	.13	.12	.13
Quebracho, 35% liquid tks...lb.	.....	.02¾	.02	.02¼	.02	.03
450 lb bbls c-1.....lb.	.02¾	.02¾	.02¾	.02¾	.02½	.03¾
35% Bleaching, 450 lb bbl..lb.	.02	.02¼	.02	.02¼	.02	.04
Solid, 63%, 100 lb bales cif..lb.	.....	.02½	.02¾	.02½	.02	.02½
Clarified, 64%, bales... lb.	.02½	.03	.02¾	.03	.02½	.03¾
Quercitron, 51 deg liquid 450 lb bbls .....lb.	.05½	.06	.05½	.06	.05½	.06
Solid, 100 lb boxes.....lb.	.09½	.13	.09½	.13	.09½	.13
Bark, Rough.....ton	.....	14.00	....	14.00	.....	14.00
Ground.....ton	34.00	35.00	34.00	35.00	34.00	35.00
R Salt, 250 lb bbls wks.....lb.	.40	.44	.40	.44	.40	.44
Red Sanders Wood, grd bbls. lb.	.....	.18	....	.18	.....	.18
Resorcinol Tech, cans.....lb.	.65	.70	.65	.70	.65	.70
Rosin Oil, 50 gal bbls, first run .....gal.	.....	....	.42	.43	.41	.45
Second run.....gal.	.40	.42	.46	.47	.45	.51

Rosin

Rosins 600 lb bbls 280 lb.....unit ex. yard N. Y.						
B.....	....	3.80	2.75	3.80	2.95	3.65
D.....	....	3.90	2.95	3.90	3.15	3.75
E.....	....	4.30	3.55	4.30	3.37½	4.00
F.....	....	4.60	3.85	4.60	3.40	4.15
G.....	....	4.60	3.90	4.60	3.45	4.15
H.....	....	4.62½	4.00	4.62½	3.45	4.20
I.....	....	4.65	4.05	4.75	3.47½	4.25
K.....	....	4.90	4.60	4.90	3.60	4.65
M.....	....	4.95	4.35	4.95	4.20	5.25
N.....	....	5.15	4.75	5.30	4.65	6.05
WG.....	....	5.25	4.80	5.60	5.25	6.45
WW.....	....	5.55	4.85	6.20	5.85	6.65
Rotten Stone, bags mines....ton	23.50	24.00	23.50	24.00	20.00	23.00
Lump, imported, bbls.....lb.	.05	.07	.05	.07	.05	.07
Selected bbls.....lb.	.09	.12	.09	.12	.09	.12
Powdered, bbls.....lb.	.02	.05	.02	.05	.02	.05
Sago Flour, 150 lb bags.....lb.	.02½	.03	.02½	.03	.02½	.04
Sal Soda, bbls wks.....100 lb.	.90	1.00	.90	1.00	.90	1.00
Salt Cake, 94-96% c-1 wks...ton	13.00	14.00	13.00	14.00	13.00	15.50
Chrome.....ton	12.00	13.00	12.00	13.00	12.00	14.50
Saltpetre, double refd granular 450-500 lb bbls.....lb.	.05¾	.06	.05¾	.06¾	.06	.06¾
Satin, White, 500 lb bbls.....lb.	.....	.01¼	....	.01½	.....	.01½
Shellac Bone dry bbls.....lb.	.18	.20	.18	.20	.16	.26
Garnet, bags.....lb.	.15	.16	.15	.16	.15	.20
Superfine, bags.....lb.	.11	.11¾	.09½	.11¾	.10	.14
T. N. bags.....lb.	.10	.10¼	.08½	.10¼	.09	.13
Schaeffer's Salt kegs.....lb.	.48	.50	.48	.50	.48	.50
Silica, Crude, bulk mines....ton	8.00	11.00	8.00	11.00	8.00	11.00
Refined, floated bags.....ton	22.00	30.00	22.00	30.00	22.00	30.00
Air floated bags.....ton	.....	32.00	....	32.00	.....	32.00
Extra floated bags.....ton	30.00	35.00	30.00	35.00	30.00	40.00
Silver.....oz.	.....	.34¼	....	....	.....	.....
Silver Nitrate, vials.....oz.	.....	.27¼	....	....	.....	.....
Soapstone, Powdered, bags f.o.b. mines.....ton	15.00	22.00	15.00	22.00	15.00	22.00

Soda

Soda Ash, 58% dense, bags c-1 wks.....100 lb.	.....	1.17½	....	1.17½	1.17½	.....
58% light, bags.....100 lb.	.....	1.20	....	1.20	1.15	1.20
Contract, bags c-1 wks..100 lb.	.....	1.20	....	1.20	1.15	1.20
Soda Caustic, 76% grnd & flake drums.....100 lb.	2.95	3.00	2.95	3.00	2.90	3.00
76% solid drs.....100 lb.	.....	2.55	....	2.55	2.50	2.55
Sodium Abietate, drs.....lb.	.....	.03	....	.03	.....	.03
Acetate, tech 450 lb. bbls wks lb.	.04½	.05	.04½	.05	.04½	.05
Alignate, drs.....lb.	.....	.50	....	.50	.....	.50
Arsenate, drums.....lb.	.07¾	.08¼	.07¾	.08¼	.....	.....
Arsenite, drums.....gal.	.50	.75	.05	.75	.50	.75
Benzoate U.S.P., kegs.....lb.	.40	.42	....	....	.....	.....
Bicarb, 400 lb bbl.....100 lb.	.....	2.25	....	2.25	.....	2.25
Bichromate, 500 lb cks wks lb.	.044	.04½	.044	.04½	.044	.05¼
Bisulfite, 500 lb bbl wks....lb.	.02¾	.03	.02¾	.03	.03	.04
Chlorate, wks.....lb.	.05¾	.07¼	.05¼	.07½	.05¾	.07¼
Chloride, technical.....ton	11.40	14.00	11.40	14.00	12.00	13.00
Cyanide, 96-98%, 100 & 250 lb drums wks.....lb.	.15½	.16	.15½	.16	.15½	.17
Fluoride, 300 lb bbls wks....lb.	.07	.07½	.07	.07½	.07	.07½
Hydrosulfite, 200 lb bbls f.o.b. wks.....lb.	.20	.21	.20	.21	.21	.24
Hypochloride solution, 100 lb. cbys.....lb.	.....	.05	....	.05	.....	.05
Hyposulfite, tech, pea cyrs 375 lb bbls wks.....100 lb.	2.40	3.00	2.40	3.00	2.40	3.00
Technical, reguiar crystals 375 lb bbls wks....100 lb.	2.40	2.65	2.40	2.65	2.40	2.65
Metanilate, 150 lb bbls....lb.	.44	.45	.44	.45	.44	.45
Metasilicate, c-1, wks..100 lb.	2.85	3.25	2.85	3.25	2.85	4.00
Monohydrate, bbls.....lb.	.....	.02½	....	.02½	.....	.02½
Naphthionate, 300 lb bbl...lb.	.52	.54	.52	.54	.52	.54
Nitrate, 92%, crude, 200 lb. bags c-1 NY .....100 lb.	.....	1.31	1.26	1.31	1.185	1.73½
Nitrite, 500 lb bbls spot....lb.	.07¼	.08	.07¼	.08	.07¼	.08
Orthochlorotoluene, sulfonate, 175 lb bbls wks.....lb.	.25	.27	.25	.27	.25	.27
Perborate, 275 lb bbls.....lb.	.17	.19	.17	.19	.17	.20
Phosphate, di-sodium, tech. 310 lb bbls.....100 lb.	2.00	2.10	2.00	2.10	2.00	2.75
tri-sodium, tech, 325 lb bbls.....100 lb.	2.15	2.50	2.15	2.50	2.15	3.20
Picramate, 160 lb kegs ....lb.	.69	.72	.69	.72	.69	.72
Prussiate, Yellow, 350 lb bbl wks.....lb.	.11½	.12	.11½	.12	.11½	.12
Pyrophosphate, 100 lb keg..lb.	.15	.20	.15	.20	.15	.20
Silicate, 60 deg 55 gal drs, wks .....100 lb.	1.65	1.70	1.65	1.70	1.65	1.70
40 deg 55 gal drs, wks .....100 lb.	.....	.75	....	.75	.....	.75
Silicofluoride, 450 lb bbls NY .....lb.	.04½	.05½	.04½	.05½	.05½	.06½
Stannate, 100 lb drums.....lb.	.19	.22½	.18	.22½	.17	.19
Stearate, bbls.....lb.	.20	.25	.20	.25	.20	.25
Sulfanilate, 400 lb bbls.....lb.	.16	.18	.16	.18	.16	.18
Sulfate Anhyd, 550 lb bbls c-1 wks.....lb.	.02	.02¼	.02	.02¼	.02	.02¼
Sulfide, 80% crystals, 440 lb bbls wks.....lb.	.02½	.02¾	.02½	.02¾	.02½	.02¾
62% solid, 650 lb drums 1c-1 wks.....lb.	.03	.03½	.03	.03½	.03	.03½
Sulfite, crystals, 400 lb bbls wks.....lb.	.03	.03½	.03	.03½	.03	.03½
Sulfocyanide, bbls .....lb.	.28	.35	.28	.35	.28	.35
Tungstate, tech, crystals, kegs .....lb.	.57	.67	.57	.67	.60	.88
Spermaceti, blocks, cases.....lb.	.17	.18	.17	.19	.....	.....
Cakes, cases.....lb.	.19	.20	.18	.20	.....	.....
Spruce Extract, ord., tanks..lb.	.....	.00¾	....	.00¾	.00¾	.01
Ordinary, bbls.....lb.	.....	.01¼	....	.01¼	.01¼	.01¾
Super spruce ext., tanks...lb.	.....	.01¼	....	.01¼	.01¼	.01¾
Super spruce ext., bbls....lb.	.....	.01¾	....	.01¾	.01¾	.01¾
Super spruce ext. powd., bags .....lb.	.....	.04	....	.04	.04	.04¼
Starch, powd, 140 lb bags .....100 lb.	2.49	2.60	2.29	2.60	2.29	2.67
Pearl, 140 lb bags.....100 lb.	2.39	2.50	2.19	2.50	2.19	2.84
Potato, 200 lb bags.....lb.	.03¼	.04	.03¼	.04	.03¼	.06
Imported bags.....lb.	.....	.05	.04¼	.05	.04	.06¼
Soluble.....lb.	.08	.08½	.08	.08½	.08	.08½
Rice, 200 lb bbls.....lb.	.07	.08½	.07	.08½	.07½	.10
Wheat, thick bags.....lb.	.05¾	.06	.05¾	.06½	.06	.07
Thin bags.....lb.	.09½	.10	.09½	.10	.09½	.10
Strontium carbonate, 600 lb bbls wks.....lb.	.07½	.07½	.07½	.07½	.07½	.07½
Nitrate, 600 lb bbls NY....lb.	.07	.07½	.07	.07½	.07	.07½
Peroxide, 100 lb drs.....lb.	.....	1.25	....	1.25	.....	1.25
Sulfur Brimstone, broken rock, 250 lb bag c-1.....100 lb.	.....	2.05	....	2.05	.....	2.05
Crude, f. o. b. mines.....ton	18.00	19.00	18.00	19.00	18.00	19.00
Flour for dusting 99½%, 100						

	Current Market	1933 Low	1933 High	1932 Low	1932 High
lb bags c-1 NY....100 lb.....	2.40	....	2.40	.....	2 40
Heavy bags c-1.....100 lb.....	2.50	....	2.50	.....	2.50
Flowers, 100%, 155 lb bbls c-1 NY.....100 lb.....	3.45	....	3.45	...	3.45
Roll, bbls 1c-1 NY....100 lb.	2.85	2.65	2.85	2.65	2.85
Sulfur Chloride, red, 700 lb drs wks.....lb.	.05	.05½	.05	.05½	05 .05½
Yellow, 700 lb drs wks.....lb.	.03½	.04½	.03½	.04½	.03½ .04½
Sulfur Dioxide, 150 lb cyl....lb	.07	.07½	.07	.07½	.07 07½
Extra, dry, 100 lb cyl.....lb	.10	.12	.10	.12	.10 12
Sulfuryl Chloride.....lb.	.15	.40	.15	.40	1/ .40
Talc, Crude, 100 lb bgs NY..ton	12.00	15.00	12.00	15.00	12.00 15.00
Refined, 100 lb bgs NY..ton	16.00	18.00	16.00	18.00	16.00 18 00
French, 220 lb bags NY....ton	18.00	22.00	18.00	22.00	18.00 22.00
Refined, white, bags....ton	35.00	40.00	35.00	40.00	35.00 40.00
Italian, 220 lb bags NY...ton	48.50	50.00	48.50	50.00	40.00 50.00
Refined, white bags.....ton	50.00	55.00	50.00	55.00	50.00 55.00
Superphosphate, 16% bulk, wks.....ton		7.00	6.50	7.00	7.00 8.00
Run of pile.....ton		6.50	6.00	6.50	....
Tankage Ground NY.....unit		2.00*	1.70	2.00*	1.30 1.50
Unground.....unit		1.75	....	....	....
High grade f.o.b. Chicago.unit		1.50	1.40	1.50	1.00 1.80
South American cif.....unit		1.85	....	1.85	1.80 2.25
Tapioca Flour, high grade bgs.lb	.03½	.05	.03½	.05	.03½ .05
Medium grade, bags.....lb.	.03	.04	.03	.04	03 04
Tar Acid Oil, 15%, drums...gal.	.21	.22	.21	.22	.21 .22
25% drums.....gal.	.23	.24	.23	.24	.23 .24
Terra Alba Amer. No. 1, bgs or bbls mills.....100 lb.	1.15	1.75	1.15	1.75	1.15 1.75
No. 2 bags or bbls...100 lb.	1.00	1.25	1.00	1.25	1.50 2.00
Imported bags.....lb.	.01½	.01½	.01½	.01½	01½
Tetrachlorethane, 50 gal dr...lb.	.08½	.09	.08½	.09	.08 .09½
Tetralene, 50 gal drs wks....lb.	.12	.13	.12	.13	.12 .20
Thiocarbanilid, 170 lb bbl....lb.	.25	.28½	.25	.28½	.25 .28½
Tin.....					
Crystals, 500 lb bbls wks..lb.	.27½	28	.24	28	.22 .25
Metal Straits NY.....lb.....		28½	.23	28½	.211 .24½
Oxide, 300 lb bbls wks.....lb.....		35	.27½	.35	.23 .26½
Tetrachloride, 100 lb drs wks .....lb.....		.1607	.126	.1607	.1420 .1457
Titanium Dioxide 300 lb bbl...lb.	.17½	.19½	.17½	.19½	.17½ .21
Calcium Pigment, bbls.....lb.	.06½	.06½	.06½	.06½	.06½ .07½
Toluene, 110 gal drs.....gal.....		.35	....	.35	..... .35
8000 gal tank cars wks....gal.....		.30	....	.30	..... .30
Toluidine, 350 lb bbls.....lb.	.88	.89	.88	.89	.88 .89
Mixed, 900 lb drs wks.....lb.	.27	.28	.27	.28	.27 .32
Toner Lithol, red, bbls.....lb.	.90	.95	.90	.95	.90 .95
Para, red, bbls.....lb.....		.80	....	.80	..... .80
Toluidine.....lb.	1.50	1.55	1.50	1.55	1.50 1.55
Triacetin, 50 gal drs wks.....lb.	.32	.36	.32	.36	.32 .36
Trichlorethylene, 50 gal dr...lb.	.09½	.10	.09½	.10	.10 .10½
Triethanolamine, 50 gal drs...lb.	.35	.38	.35	.38	.35 .42
Tricresyl Phosphate, drs.....lb.	.21	.26	.21	.26	.21 .26
Triphenyl guanidine.....lb.	.58	.60	.58	.60	.58 .60
Phosphate, drums.....lb.	.37	.39	.37	.39	.50 .65
Tripoli, 500 lb bbls.....100 lb.	.75	2.00	.75	2.00	.75 2.00
Tungsten, Wolframite..per unit.	10.00	11.00	10.00	11.00	10.00 11.75
Turpentine carlots, bbls. ...gal.....		.47	.46¼	.50	.39 .47½
Wood Steam dist, bbls....gal.....		.44	.42	.46	.42 .46
Urea, pure, 112 lb cases.....lb.	.15	.17	.15	.17	.15 .17
Fert. grade, bags c.i.f.....ton.....		82.60	....	82.60	..... 82.60
c. i. f. S. points.....ton.....		82.60	....	82.60	..... 82.60
Valonia Beard, 42%, tannin bags.....ton.....		29.50	27.50	29.50	28.50 34.00
Cups, 30-31% tannin.....ton.....		17.50	17.00	19.00	19.00 23.50
Mixture, bark, bags.....ton.....		22.00	....	22.00	22.00 26.00
Vermillion, English, kegs.....lb.	1.15	1.25	1.05	1.40	1.28 1.80
Vinyl Chloride, 16 lb cyl.....lb.....		1.00	....	1.00	..... 1.00
Wattle Bark, bags.....ton.....		25.00	24.00	27.00	26.00 33.00
Extract 55%, double bags ex-dock.....lb.	.03	.03½	.03	.03½	.03 .06½
Whiting, 200 lb bags, c-1 wks .....100 lb.	.85	1.00	.85	1.00	.85 1.00
Alba, bags c-1 NY.....ton.....		13.00	....	13.00	..... 13.00
Gilders, bags c-1 NY...100 lb.....		1.35	....	1.35	..... 1.35
Wood Flour, c-l.....bags	18.00†	24.00	18.00	36.00	....
Xylene, 10 deg tanks wks...gal.	.27	.29	.27	.29	..... .29
Commercial, tanks wks...gal.....		.26	....	.26	..... .26
Xylidine, crude.....lb.	.36	.37	.36	.37	.36 .37
Zinc Ammonium Chloride powd., 400 lb bbls.....lb.	.04½	.05	.04½	.05	..... 5.75
Carbonate Tech. bbls NY..lb.	.09½	.11	.09½	.11	.09½ .11
Chloride Fused, 600 lb drs wks.....lb.	.05	.05½	.05	.05½	.05 .06
Gran, 500 lb bbls wks.....lb.	.05½	.06	.05½	.06	.05½ .06
Soln 50%, tanks wks...100 lb.....		3.00	....	3.00	2.25 3.00
Cyanide, 100 lb drums.....lb.	.38	.39	.38	.39	.38 .39
Dithiofuroate, 100 lb dr....lb.....		1.00	....	1.00	..... 1.00
Dust, 500 lb bbls c-1 wks..lb.	.06¼	.07¼	.04¾	.07¼	.041 .0525
Metal, high grade slabs c-1 NY.....100 lb.....		3.27	3.02	3.32	2.87 3.52
Oxide, American bags wk...lb.....		.05½	....	.05½	.0485 .07
French, 300 lb bbls wks...lb.	.05½	.11½	.05½	.11½	.08½ .11⅜
Palmitate, bbls.....lb.	.17½	.18½	.17½	.18½	....
Perborate, 100 lb drs.....lb.....		1.25	....	1.25	..... 1.25
Peroxide, 100 lb drs.....lb.....		1.25	....	1.25	..... 1.25
Resinate, fused, dark, bbls.lb.	.05¾	.06½	.05¾	.06½	....
Stearate, 50 lb bbls.....lb.	.15	.15½	.15	.17	.16 .22
Sulfate, 400 bbl wks.....lb.	.03	.03½	.03	.03½	.03 .03½
Sulfide, 500 lb bbls.....lb.	.12	.13	.12	.13	.12 .13½
Sulfocarbolate, 100 lb keg..lb.	.21	.22	.21	.22	.21 .24
Zirconium Oxide, Nat. kegs...lb.	.02½	.03	.02½	.03	.02½ .03
Pure kegs.....lb.	.45	.50	.45	.50	.45 .50
Semi-refined kegs.....lb.	.08	.10	.08	.10	.08 .10

*&10 †Depends upon grade

Oils and Fats

Castor, No. 1, 400 lb bbls....lb.....	.09¼	.09½	.10	.09½	.10½	
No. 3, 400 lb bbls.....lb. .08¾	.09	.08½	.09½	.08½	.10½	
Blown, 400 lb bbls.....lb. .11¼	.11¾	.11¼	.11¾	.11½	.12½	
China Wood, bbls spot NY...lb.....	.06	.04½	.06	.05½	.07½	
Tanks, spot NY.....lb.....	.05½	.04½	.05½	.04½	.06½	
Coast, tanks.....lb.....	.05	.04½	.05	.04½	.06½	
Coconut, edible, bbls NY....lb.....	.10¾	....	.10¾	.....	.10¾	
Ceylon, 375 lb bbls NY....lb.....	.04½	.04	.04½	.04	.04¾	
8000 gal tanks NY.....lb.....	.03¼	.03	.03¾	.02¾	.03¾	
Cochin, 375 lb bbls NY....lb.....	.05	.04½	.05	.04½	.06	
TanksN Y.....lb. .04	.04¼	.04	.04¼	.03½	.05	
Manila, bbls NY.....lb.....	.04½	.04	.04½	.04	.05	
Tanks NY.....lb. .03¼	.03½	.03½	.03½	.03½	.04	
Tanks, Pacific Coast.....lb.....	.03	.02½	.03	.02½	.03½	
Cod, Newfoundland, 50 gal bbls .....gal.....	.22	.19	.22	.21	.30	
Copra, bags, N. Y.....lb. .016	.0162	.016	.019	.0175	.0235	
Corn, crude, bbls NY.....lb.....	.05¼	.05½	.05¾	.04½	.09	
Tanks, mills.....lb.....	.03¾	.02¼	.03¾	.02¾	.04½	
Refined, 375 lb bbls NY...lb.....	.06½	.06¼	.06½	.05½	.07	
Tanks.....lb.....	.06	.05¼	.06	.05	.08¾	
Cottonseed, crude, mill.....lb.....	.04	.02½	.04	.02½	.04½	
Degras, American, 50 gal bbls NY.....lb. .02½	.03	.02½	.03	.02½	.04	
English, brown, bbls NY...lb. .03	.03¼	.02¼	.03½	.02½	.04	
Greases, Brown.....lb. .02	.02½	.02	.02½	.01¾	.02¾	
Yellow.....lb. .02¼	.02½	.01¾	.02½	.01¾	.03	
White, choice bbls NY.....lb.....	.03½	.02½	.03¾	.02	.04½	
Herring, Coast, Tanks.....gal. .11	.12	.11	.12	.....	.....	
Lard Oil, edible, prime.....lb.....	.08¼	.08½	.08¾	.08¼	.10	
Extra, bbls.....lb. .07½	.07⅝	.07½	.07⅝	.05½	.07¾	
Extra No. 1, bbls.....lb.....	.06½	.06	.06½	.05½	.07	
Linseed, Raw, five bbl lots...lb.....	.09	.08	.09	.061	.078	
Bbls c-1 spot.....lb.....	.081	.072	.081	.053	.07	
Tanks.....lb.....	.075	.066	.075	.047	.064	
Menhaden Tanks, Baltimore.gal.....	.10	.09	.10	.09½	.20	
Extra, bleached, bbls NY..gal. .36	.37	.36	.37	.36	.40	
Light, pressed, bbls NY....lb .039	.045	....	....	.....	.....	
Yellow, bleached, bbls NY.gal. .30	.30½	.30	.30½	.30	.37	
Neatsfoot, CT, 20° bbls NY...lb.....	.14	.11¾	.14	.11½	.13½	
Extra, bbls NY.....lb.....	.07	.06½	.07	.05¾	.07	
Pure, bbls NY.....lb.....	.10½	.07¾	.10½	.07¾	.09	
Oleo, No. 1, bbls NY.....lb.....	.06½	.05	.06½	.05¾	.07	
No. 2, bbls NY.....lb.....	.05½	.04¼	.05½	.04¼	.06	
No. 3, bbls NY.....lb.....	.06½	....	.06½	.....	.06¾	
Olive, denatured, bbls NY...gal.....	.58	.47	.60	.51	.65	
Edible, bbls NY.....gal. 1.30	1.50	1.30	1.50	1.25	2.00	
Foots, bbls NY.....lb.....	.04½	.04¾	.04¾	.04¼	.05	
Palm, Kernel Casks.....lb.....	.04½	.04	.04½	.035	.04¾	
Lagos, 1500 lb casks.....lb. .03¼	.03½	.02¾	.03½	.03	.05	
Niger, Casks.....lb.....	.033	.024	.033	.03	.03½	
Peanut, crude, bbls NY.....lb.....	.06½	.03¾	.06½	.02¾	.04½	
Refined, bbls NY.....lb.....	.08½	....	.08½	.08¾	.09	
Perilla, bbls NY.....lb.....	.06	.05	.06	.03¾	.05¾	
Tanks, Coast.....lb. .04½	.05	.03¾	.05	.03¾	.05	
Poppyseed, bbls NY.....gal. 1.60	1.70	1.60	1.70	1.60	1.75	
Rapeseed, in bond, bbls NY.gal.....	.33	.33	.34	.....	.....	
denatured, drms, NY.....gal.....	.36	.34	.36	.....	.....	
Red, Distilled, bbls.....lb.....	.06¼	.05¾	.06¼	.06¼	.07	
Tanks.....lb.....	.05½	.05	.05½	.05½	.06	
Salmon, Coast, 8000 gal tks.gal.....	.15	.11	.15	.11	.19	
Sardine, Pacific Coast tks...gal.....	.15	.09½	.15	.09½	.17½	
Sesame, edible, yellow, dos...lb. .09½	.10	.09½	.10	.08½	.09¾	
White, dos.....lb. .10	.11	.10	.11	.10	.11	
Sod, bbls NY.....gal.....	.40	....	.40	.....	.40	
Soy Bean, crude.....						
Pacific Coast.....lb. .032	.035	.032	.035	.02¾	.03½	
Domestic tanks, f. o. b. mills, ...lb.....	.045	.027	.045	.03	.032	
Crude bbls NY.....lb.....	.051	.04	.051	.03¾	.05	
Refined, bbls NY.....lb. .056	.06½	.04½	.06½	.04½	.06	
Sperm, 38° CT, bleached, bbls NY.....gal.....	.88	.68	.88	.68	.70	
45° CT, bleached, bbls NY.gal.....	.81	.63	.81	.63	65	
Stearic Acid, double pressed dist bags.....lb. .07½	.08	.07½	.08	.07½	.09	
Double pressed saponified bags .....lb. .08	.08¼	.08	.08¼	.07	.08¼	
Triple, pressed dist bags..lb.....	.10½	.10½	.10½	.10½	.11	
Stearine, Oleo, bbls.....lb.....	.04¼	.03½	.04¼	.03¾	.06	
Tallow City, extra loose.....lb. .02½	.02⅝	.02	.02⅝	.02½	.03¼	
Edible, tierces.....lb.....	.03¾	.03½	.03¾	.03¼	.04½	
Tallow Oil, Bbls, c-1 NY...lb. .05¼	.06	.05¾	.06	.05¼	.07½	
Acidless, tanks NY.....lb.....	.06	.05	.06¾	.06	.09	
Vegetable, Coast mats.....lb. .06	Nom.	.06	Nom.	.06	Nom.	
Turkey Red, single bbls.....lb. .06¼	.07½	.06¼	.07½	.06½	.09	
Double, bbls.....lb. .08	.09	.08	.09	.08	.11	
Whale, bleached winter, bbls NY.....gal.....	.74	....	.74	.....	.74	
Extra, bleached, bbls NY..gal. .59	.61	.51	.61	.51	.60	
Nat. winter, bbls NY.....gal. .63	.65	.45	.65	.45	.55	